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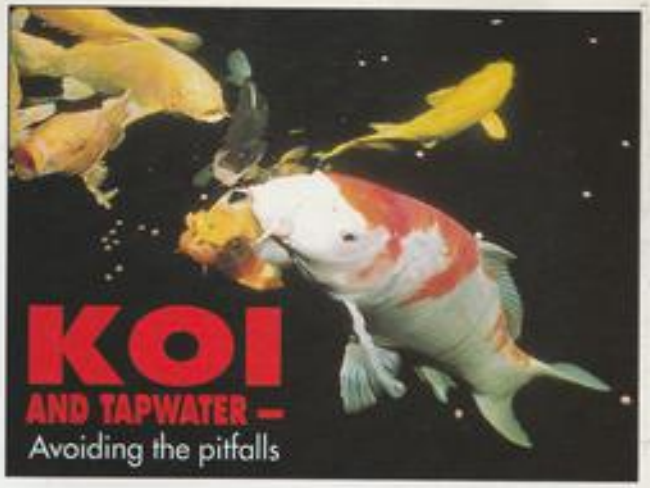

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AND TAPWATER —
Avoiding the pitfalls

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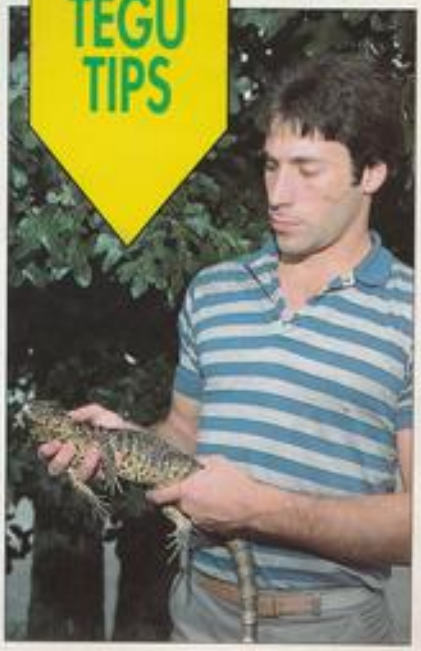

70 PRIZES TO WIN IN OUR John Allan BIRTHDAY BONANZA COMPETITION

PLUS

CLOSE-UP ON THE MOOR

WIN A SET OF Tetra PLANTASTICS

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EDITORIAL

IT'S OUR 70th BIRTHDAY!

Yes, we are 70 years old this month, and still going as strong as ever. In fact, since last November, we could justifiably say that we are even livelier that at any stage in our long, colourful, eventful life.

Starting off as the ***Amateur Aquarist*** in May 1924, ***A&P*** has seen many changes in format and design, but has never neglected its original ideals. See, for example, **Stephen Smith's** excellent article **Back to the Future** within this issue for more on this.

We have always moved and evolved with the times and now attract an enthusiastic worldwide readership. As one of our new advertisers said on the 'phone the other day: "I expected enquiries from the UK, but have been absolutely staggered to receive faxes, 'phone calls and letters from, among other countries, Thailand, Sri Lanka, Finland, Malaysia, the US and New Zealand!".

Yes, we are truly international... and not just in our readership. Our team of authors, and the range of subjects we cover, also come from every corner of the globe.

And that's how we want to keep things, bringing you the best in aquatics, herpetology and all related sujects from wherever that 'best' may originate. So why not join us for the next 70 years of top-flight aquatic entertainment? They are sure to be every bit as exciting as the past 70 have been.

We look forward to your company...

John Dawes

The majestic Moor.
MAX GIBBS, THE GOLDFISH BOWL, OXFORD

CLOSE-UP ON MOORS

Coldwater Jotter **Stephen Smith** focuses on the many delights … and permutations … of this beautiful, velvety Fancy Goldfish.

Illustrations — unless otherwise indicated — by the author

A jet-black colouring with a sooty texture, protruding globe-shaped eyes and a full rounded body shape, and long flowing finnage … What other fish throughout the fishkeeping hobby can offer such a richness of beauty and character — and all this from a variety which has been developed from the oft-humbled common, or Ancestral, Goldfish *Carassius auratus*?

Of course, this has to be the Moor, one of the most attractive and endearing of the 'fancy' varieties of Goldfish. Often referred to as the 'black' Moor (it can be, and is, no other colour!) the Moor is the most regal of the Fancy Goldfish and has been a firm favourite among Goldfish *aficionados* throughout the world for decades.

Viewed from the rear, the silhouette of the splayed caudal fins of the Butterfly Moor is reminiscent of the wings of a butterfly.

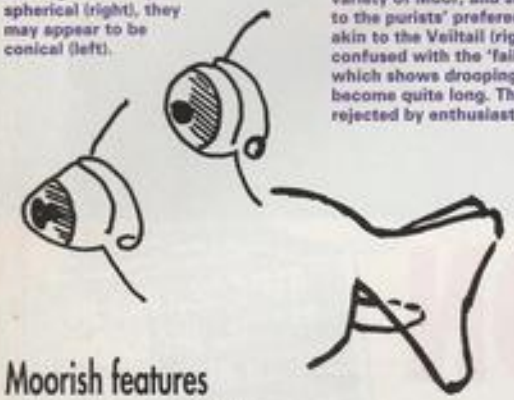
The 'standard' form of the Moor, to which breeders aspire. Note the high dorsal fin and the Veiltail-type finnage.

BILLY WHITSON

Just look at those eyes!

Below, this elegant Panda has superb finnage, with a high and proud dorsal fin and 'butterfly' caudal fins. Speckles of orange only serve, in my opinion, to make this specimen all the more attractive.

Below, the shape of the eyes of the Moor are traditionally described as 'telescopic'. Usually, they form a pair of spheres which appear to be 'attached' to either side of the head. The eyes vary in shape from one strain of Moor to another, and although normally spherical (right), they may appear to be conical (left).



MAX GIBB, THE GOLDFISH BOWL, OXFORD

The 'Fantail'-type caudal finnage (left) is a common feature of an increasingly popular variety of Moor, and shows a marked contrast to the purists' preference for caudal fins more akin to the Veiltail (right). This should not be confused with the 'fail-tail' (centre figure) which shows drooping forks which eventually become quite long. This 'fail-tail' would be rejected by enthusiasts as a significant fault.

Moorish features

Perhaps the most intriguing characteristic of the Moor just has to be its protruding eyes. Termed loosely 'globe' eyes, these are positioned virtually 'outside' the head. Usually, the shape of the eyes is perfectly spherical, although there are variations from one strain of Moor to another, ranging from the more usual spherical, to almost conical.

The colour of the eyes, too, is specific to the Moor. Whereas with the popular varieties of Fancy Goldfish the eyes are normally of an 'iris' type (ie: a black pupil surrounded by a 'bronze' iris), both the pupils and the irises of the Moor are often seen to be black. Occasionally, the iris may be more of a dark bronze, especially as the fish matures.

It is this sheer *blackness* of the Moor which adds to the attraction of this variety. Quite literally, from the tip of the nose, right down to the fringe of the tail, the only colour of the Moor *is* black: black eyes, black head, black body, and black fins. I suppose it is small wonder, then, that this variety is often mistakenly referred to as the *Black* Moor!

Turning to the finnage, ideally this should bear all the characteristics of finnage of the classic Veiltail. A high dorsal (back) fin, held erect like the sail of a yacht, makes for a magnificent sight. Breeders will strive to ensure that this feature, in particular, is developed within their strain by paying attention to the characteristic of strong leading dorsal muscles to hold high the leading rays of the dorsal fin, and to the integrity of those leading rays. In some, inferior specimens — by Show Standards, that is — the dorsal fin itself, to 'flop' over towards the top.

A 'swarm' of young Moors photographed at a rearing establishment in Singapore. This was only part of a rearing pond the area of at least two tennis courts!

The importance of the fin rays should not be underestimated; the shape of the finnage is dependent upon the strength of the leading rays of the dorsal fin, and of the uppermost rays of the caudal (tail) fins.

A fully-divided caudal fin is a desirable feature, from the point of view of Show Standards. However, for your own fish, don't be at all concerned if they do not match the purists' aspirations. There is absolutely nothing wrong at all with the caudal fins being fused, either partly or fully (termed 'webbed') and, indeed, provided you have a good strain, you will very likely produce a fair number of offspring which have fully divided caudal fins.

Acceptable alterations

If the Moor is to adhere to the 'Veiltail' type of standard, then the lower margin of the caudal fins should be straight and almost horizontal. However, a compromise is reached with some Society

The Moor makes a superb aquarium fish, where its shape and elegance can be fully-appreciated.

JOHN DAWES

Caught in mid-swim, this is one of the most recent of derivatives of the Moor: the Pearlscale Moor, and was introduced to the Goldfish scene at Aquarama '93. Note the 'butterfly' shape of the caudal (tail) fins.

POINTS TO PONDER

1 The Moor is one of the most popular varieties of the Goldfish, *Carassius auratus*.

2 The Moor, in common with many of the 'Fancy' Goldfish, is far more suited to the aquarium (rather than the garden pond), where its attractive finnage and round body shape can be better appreciated.

3 When breeding for quality Moors, choose the best specimens you can find (and afford!). Reference to recognised Show Standards can provide a useful guide to the points of quality to look for in your broodstock. However, a good show fish does not guarantee success. Conversely, a slightly 'inferior' pair of specimens can produce show-winning offspring — as long as the stock is from a line which is as 'pure' as possible (a good breeder will be able to tell you about the history of the breeding line).

4 Look out for:
(a) Moors with an indeterminate breeding line: ensure that Moors you purchase, especially for breeding, are from good line-bred stock;
(b) Uneven (asymmetrical) eyes;
(c) Missing or split fins, especially the caudal fin (apart from a complete division of the uppermost rays);
(d) A 'rogue' hood growth, betraying a possible outcrossing (perhaps with an Oranda) further back down the breeding line;
(e) Infection of the skin or eyes, shown by a white bloom;
(f) Single or fused anal fins;
(g) White streaks in the finnage (this is *not* a sign of disease, but a stray gene affecting coloration);
(h) Tubercles on the leading rays of the pectoral fins and on the operculi (gill covers): these are a sign of a healthy fish and should not be treated as White Spot!

Standards, which accept that a slight 'scallop', or wide vee-shape of the fringe, will occur with this variety, and these are termed **'Broadtails'**.

This 'scallop' is a genetic reversion to type (ie: back to the original shape of the Ancestral, or Common, Goldfish) and often resembles the Fantail-type finnage. Many specimens with Fantail-type caudal fins (often referred to as 'fail'-tails) may result from a crossing of even the best Moors, and thus, it is no surprise that thousands upon thousands of **Fantailed Moors** are bred and sold for their commercial appeal.

Personally, I feel that such a variety can be every bit as valid as a Veiltail- or Broadtail Moor. After all, if it is to your own personal taste, why on earth shouldn't you keep it?

Other fins

Let's not overlook the ventral (pelvic), pectoral, and anal fins, which play an equally important role in the beauty of this variety of Fancy Goldfish.

The anal fins are usually hidden behind the long, flowing caudal finnage. Situated just above the anus, the anal fins should, preferably, be paired and of equal length. Often, as with all of the 'Veiltailed' varieties of Goldfish, the anal fins can be quite long, and may even protrude outside the caudal fins.

The ventral and pectoral fins are situated either side of the body in pairs, the ventral fins being half-way along the body and, thus, the lower pair, and the pectorals being situated just behind the gills. Again, as with all 'Veiltailed' Fancy Goldfish, these fins are fairly long and somewhat pointed, and help to add visual balance of form to the fish.

Exotic lines

A highly-developed version of the 'Fantailed' variety of Moor is the **Butterfly Moor.** Although Butterfly Moors generally appear to be smaller in the body than the traditional Moor, the caudal fins of this variety have been developed to be splayed at almost right-angles to the caudal peduncle (the margin between the tail and the body). Thus, from the rear, this presents a silhouette strikingly similar to an exotic butterfly.

This caudal feature has also been retained, to some extent, in a derivative of the Moor which achieved a great deal of popularity among UK Goldfish keepers a few years ago: the **Panda.**

Essentially, the Panda is a Butterfly Moor with a black-and-white body. However, the genetic strength (or weakness) of the blackness in Butterfly Moors has led to many examples of this variety turning colour, with the black areas becoming orange. I have even known of the white areas turning orange, eventually leading to a not unattractive orange-and-black fish!

The hobby of Goldfish keeping started with the Chinese over 1,000 years ago, so it is no surprise that, right up to the present day, the Chinese and, to some extent the Japanese and others, are continually striving to develop new strains. The latest of these, to my knowledge, is a **Pearlscale Moor.** I had the honour of seeing first-hand, the first-ever Pearlscale Moor shown to the Western world at Aquarama '93 in Singapore.

I am sworn to secrecy by the breeder of this superb new variety not to reveal how the Pearlscale Moor was developed, but suffice to say that this variety has only been introduced after the breeder had produced several generations in order to ensure that the line is as 'fixed' as possible at this stage.

While I have yet to see the first Pearlscale Moors freely available throughout the UK, I am looking forward to this striking new variety presenting a new challenge to breeders and enthusiasts in coming years. AAP

Tomorrow's Aquarist

BY GINA SANDFORD

Pond plants without a pond

For many of us, having a garden with a pond is a luxury. But, even without these facilities you can grow a few marginal plants for your amusement.

All you need is a large box, such as a polystyrene box in which fish are transported; this is ideal for use for a single growing season. Alternatively, a decorative wooden container, such as a half barrel, lined with polythene, makes a welcome addition to a balcony or patio. The container doesn't have to be deep, because you are going to create a marsh, not a pond.

Fill your container three-quarters full with compost. I've had good results using half and half of a soil-based compost and a peat-based compost ... and almost as good results using whatever I happened to have to hand!

My choice for plants are Irises, in particular, *Iris laevigata*, because it comes in all sorts of colours, Marsh Marigolds (*Caltha palustris*) — just because I like them, Water Forget-me-not (*Myosotis* sp.) — because it always grows like a weed, and Water Mint (*Mentha aquatica*) — because I like the smell! The last two are not the best choice because of their rampant habits but, kept in check, they are fine.

You could try any of the marginals offered for sale, but do remember that tall plants will need to be tied to a support if the site is windy, otherwise they will be blown over.

Always ensure that the compost is wet. I use old fish tank water to top up the container and try to maintain an inch of water above the surface of the compost. If you only wish to grow a couple of plants, then an Iris plus, say, Bog Bean (*Menyanthes trifoliata*) with a couple of strategically placed large pebbles (these need to be placed on a brick which is standing on the base of the container, otherwise the pebble sinks into the soil) make a very attractive arrangement.

One of my container grown — choices, *Iris laevigata* var *alba violacea* which has lovely white flowers with a hint of violet in them.

They're egglayers ...

Well, that's informative, isn't it? How many times have you heard that comment and, yes, I've been guilty of glibly answering in that manner. It covers a multitude of egglaying possibilities.

Think about it. Some fish place their eggs on various substrates — leaves, rocks, wood etc. Others just scatter their eggs over plants. Many marines scatter their eggs and leave them to drift with the plankton.

Floating bubble nests are constructed by some to hold the eggs in the best possible position for their development, while other species dive into the substrate to deposit their eggs.

In exceptional circumstances the eggs are carried around by one or other of the parents in brood pouches or even attached to a hook on the head, cups on the belly or stuck in a tight cluster near the vent!

So, next time you want to set about breeding an egglayer, first of all try to determine the method it uses, and then provide the necessary conditions.

Laying eggs on a small rock like this large cichlid is doing, is just one of countless methods employed by egglayers.

Mutants or creations?

I've seen it all now. To me, Rams are beautiful in their own right, and, given the correct conditions, they are almost perfection itself. So, when I saw some long-finned Rams offered for sale, it was like a red rag to a bull!

What are we doing? Are we never satisfied? Has anyone bothered to see what long-term effects messing about with a fishes genes has? I doubt it.

Maybe I'm wrong. Perhaps the research has been done. However, personally, I still cannot condone it. What do you feel?

For some of you who have just started out in the hobby, these long-finned varieties may be the first Rams of any kind that you have seen, and you may not even realise that they are varieties. If you want fish with long finnage, there are some that occur naturally, so why should you query a long-finned fish offered for sale?

I feel we should be concentrating on maintaining a healthy, well balanced stock of natural species that are bred for their vigour and not their impurities, rather than messing with nature. That way, should a species become extinct, we have a nucleus to breed from and, if possible, reintroduce into the wild.

To me, this is far more important than genetic meddling for meddling's sake. But that's only my outlook. What's yours?

Aquatic flesh eaters

Looking into a dealer's tank the other week I saw some Bladderwort. I suppose to most people one ferny-looking water plant is much like any other ferny-looking water plant. However, this one has little tiny bladders on it.

Most of us are familiar with Pitcher Plants, Venus Fly Traps, Butterworts and Sundews, but how many of us realise that there are some totally aquatic carnivorous plants? The Bladderworts (*Utricularia* spp) have terrestrial (land-living) species and aquatic species. They are stranger in that, at no time, do they have roots; they just produce long stems or stolons from which leaf-like structures appear.

The traps are attached to the 'leaves' by short stalks. The prey is drawn into the trap when it opens, as the internal pressure of the trap is less than that of the surrounding water. Once the prey has been sucked inside the trap, the 'door' instantly closes. If you 'back light' the traps, you can see those which contain prey. Depending on size, traps will take all manner of small invertebrates like *Daphnia*, Cyclops, rotifers etc.

Aquatic Bladderworts can be grown in an aquarium. The one thing that must be avoided at all costs is algae, especially thread algae, as these will choke the bladders.

Mostly, Bladderworts float just below the water surface and, if conditions are right, they will reward you by flowering.

If you want further information, the **Carnivorous Plant Society** will be pleased to help. Write to the **General Secretary, Steve Cottell, 1 Orchard Close, Ringwood, Hants BH24 1LP** and don't forget to enclose a stamped addressed envelope for a reply.

The Bladderwort is a delicate-looking 'predatory' plant.

Planting your aquarium

Plants play an important part in any aquarium. They provide important hiding places for the fish, they make the aquarium look much better, and small aerobic bacteria grow on the leaves which can be eaten by some fish.

However, real plants can be difficult to look after; unless the lighting and heating is right, they will die off, or the fish may eat them or dig them up. In addition, undergravel filters (if run by power heads) and water treatments can harm live plants. It's not surprising therefore that plastic plants are becoming more and more popular and, in America, they have virtually taken over from the real thing.

Tetra — which is well known for its fish foods and treatments — has now added a selection of over 160 plants to its range. Known as '**Second Nature Plantastics**', the plants are all extremely life-like and include species such as the Amazon Sword Plant, small plants for the front of the tank and plants up to 18in high for the side and back. All have been carefully designed to resemble real plants and have thin leaves with veins which sway in the water. They have also been sandblasted to give a more realistic rough texture, which also encourages the growth of aerobic bacteria.

If you prefer a more dazzling display, you can also get some 'pearl effect' plants and some 'flourescent' colours to create a really fun effect.

Tetra TA COMPETITION

We have five sets of five plants of **Second Nature Plantastics** to give away this month. Each set is worth around £15. All you have to do is study the word search and find the following words:

Aquarium	**Display**
Plants	**Tetra**
Veins	**Bacteria**
Fish	**Sway**

The words may be horizontal, vertical or diagonal. Send your completed word search, with your name and address, to **Aquarist & Pondkeeper Competition, Tetra, Lambert Court, Chestnut Avenue, Eastleigh, Hants SO5 3ZQ.** The closing date for receipt of entries is **30 May**.

WORD SEARCH

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

Books

Enjoying Cichlids

By: Ad Konings (Ed)
Published by: **Cichlid Press**
ISBN: 3-928457-17-9
Price: £29.00

I applaud Ad Konings for applying the policy of editing articles from specialist experts in the field of cichlid husbandry (that he's used so successfully in the *Cichlid Yearbooks*) to a new book covering the whole sphere of cichlid keeping. In so doing, he has ensured that the book user receives precise information eloquently combining practical fishkeeping expertise with synopses of current knowledge of natural environments.

Ad's editorial role no doubt played a large part in making the book highly readable, while simultaneously providing a quite useable reference text.

The book consists of a series of brief introductory chapters, discussing aspects of the successful maintenance and is particularly noteworthy for providing concise information on two cichlid diseases (Hole-in-the-head, and 'Malawi' Bloat). It also includes a usefully illustrated guide to sexing cichlids by examination of the genital pores.

The remainder of the chapters cover the various cichlid faunas: Victorian, Malawi, Central Americas etc. and include unusually good coverage of the Pike Cichlids (*Crenicichla*) containing much new information on the dwarf species and the rapids-dwelling *Teleocichla*.

Each chapter is subdivided into sections describing various groups of species. These groupings sometimes hold ecological (eg Victorian pharyngeal crushing molluscivores) or taxonomic meaning (eg *Thorichthys* group) but, unfortunately, they also include seemingly artificial aggregations.

Creating groups such as a so-called *Neolamprologus leleupi* group (which includes large piscivores such as *Lepidolamprologus elongatus*, and small invertebrate predators such as *N. leleupi* and *N. mustax*) seems misguided. I am uncomfortable with artificially created (or implied) relationships, though I appreciate the need to provide maximum information in minimum space.

Each chapter balances neatly between the provision of information (and much that is new to a book) and the need to be precise without being brief, except perhaps in two chapters. The Dwarf South American species receive very scant treatment; *Apistogramma* deserves broader coverage, as it is a large genus that can be satisfactorily subdivided.

The Madagascar cichlids chapter was unfortunate to cover only *Paratilapia polleni* (which may actually be *P. bleeken*) at a time when the other species are being collected and information about them is becoming available. It has, consequently, missed the proverbial boat a little in this area.

On the whole, this book is well informed, covering nearly all areas of the family Cichlidae in a well written style. It is a book that will provide anyone with a good informative read, as well as act as a reference book to dip into for specific information when required.

Trevor Baker

The Natural Aquarium

By Satoshi Yoshino and Doshin Kobayashi
Published by: **TFH Publications Inc**
ISBN: 0-86622-629-X
Price: £14.95

Tropical Fish ... as a Hobby

By Mary Ellen Sweeny
Published by **TFH Publications Inc**
ISBN: 0-86622-520-X
Price: £4.95

In July 1993 we featured *The Biotope Aquarium* fromTFH. *The Natural Aquarium* is the next logical step in recreating a small slice of nature in your own home — and isn't that what 'aquarism' is all about? This hardback volume provides no less than 22 design options to help you imitate nature with an aquarium set-up which ensures that the right plants and fish are kept together; whether your fancy is for an aquarium of livebearers from Central and South America, the jungles of South-east Asia, or the streams or lakes of East or West Africa.

As you might expect, I particularly enjoyed the section on creating an aquarium featuring water lilies and other plants representing a tropical water-hole in an Asiatic swamp, not least because of the environment provided for some very attractive Gouramis.

No book on aquatics can survive these days without photographs, and the quality and quantity of these is superb, enhanced with lamination which really seems to bring the subject to life.

The lamination treatment is, surprisingly, not given to *Tropical Fish... as a Hobby*. This is the latest in a series of *...as a Hobby* volumes and follows a similar format as its predecessors.

If you are a beginner to the hobby, this book will 'hold your hand' in guiding you through all the elements of making the most of your new-found interest and, even when you become more experienced, you will wish to dip into it from time to time as a refresher.

Some of the illustrations are a trifle unnecessary (do we really need a diagram of a bucket being filled from a sink, or a photo of a youngster holding a box filter?) but, at just £4.95, this book is superbly priced and highly recommended.

Stephen J. Smith

Video

The secrets of a successful Garden Pond

By Bill Kittle
Available from: B.I. Productions, 125 Queenborough Road, Halfway, Sheerness, Kent, ME12 3DE. Telephone: 0795 665058.

This video is the latest in a collection of coldwater fish videos produced by Bill Kittle. Although much of the information is relevant to the Koi keeper, the content is aimed at the general coldwater pond keeper.

The action starts with the imitation 'natural' pond and how, even when well planted, it may take years to establish good quality water. The video then discusses the selection of style of pond (formal, informal, raised, etc), its siting, and the materials which a new pond builder can use. Constructional details of both pond and waterfall are considered, as is the need for external biological filtration.

The importance of plants in poorly or unfiltered ponds is stressed; so is the need to use sterilised aquatic soil for planting same.

The video then continues with a look at many types of coldwater fish that can be purchased. It stresses the need for awareness of correct stocking rates, the importance of bringing some varieties of fish into the house during the winter and considers food and feeding rates during the summer months.

The Secrets of a Successful Garden Pond runs for 1 hour, gives an excellent insight into the art of building and maintaining a garden pond and is available from your local aquatic store.

David Twigg

CARING FOR CRABS

British coasts harbour a wealth of crab species. **Ford West** shows just how varied and widely distributed these beautiful creatures are.

Illustrations by the author


SHORE CRAB

While in conversation with a young man who had just caught a tiny crab in a rock pool, I discovered that he had a coldwater marine aquarium in his garden , and he invited me along to see it. He lived about 70 miles from the coast, and made trips to the beach regularly for fresh seawater, so I was eager to see his set-up.

On a well-shaded north side of a giant blue cedar tree, he had built a strong stand, and on that were three tanks which were well protected from the sun. A wooden structure above prevented rain entering the tanks. In the four-foot long main tank were rocks at one end, with seaweed dangling into the rock pool that formed the remainder of the tank.

The other two tanks held water only, and were connected with the large one by thin aerator tubes carrying water. One, set low enough to siphon out the water from the pool at a very slow rate (with an adjustable peessure clamp on it); the other set higher, and governed by a time switch which every twelve hours pumped the water from the first tank to the higher second one, whence it was slowly siphoned back into the pool; the gentle circulation simulating the effect of tidal action.

That happened some years ago, and I remember trying to achieve the same result, only to have difficulty obtaining a small enough water pump. About a year later, I called to see the young man again, but he had moved away, and I could never trace him.

Messy feeders

However, he had made me realise the absolute necessity of siting such a tank outside, of shading it, and of making sure there was plenty of new fresh seawater available at regular intervals.

Gradually, other experiences led me on to add more 'musts'. When keeping crabs, for instance, it should be realised that they are messy eaters, leaving lots of small pieces to pollute the water; therefore the water must be changed fairly often. It is no use relying on anemones clearing the water, for they miss a lot, and, in addition, have been known to catch and eat small crabs. If you are keeping crabs, and cannot change the water as often as you would wish, then use aeration and filtration, for that will help considerably (most aquarists would, in fact, regard this as an absolute necessity).

Another variation in tank lay-out that is useful is to have a section of sand that is water-logged between the rocks and the pool end. This can be arranged by a wall of rocks being built to retain the sand, and yet not prevent the water from soaking it. Occasionally, it is necessary to move some sand from where it has leaked into the pool, but with a good design, this should not happen too often.

Right size

There are many crabs that would seem too big for any aquarium, but it is usually possible to find young specimens of most kinds, and these can be just as interesting. Of course, the Shore Crab is probably the easiest to find, but it is possible you will pick up a young Edible Crab instead, for when young they look alike.


A B

SILHOUETTES OF CRAB CARAPACES
A. Edible Crab. B. Shore Crab

There is an easy way to distinguish these two, however. Look at the crab carapace silhouettes shown here. The Shore Crab is as wide as it is long, while the Edible Crab is twice as wide as it is long. Once this realised, distinguishing between these two is easy at any stage of their growth.

1 Shore Crab

Carcinus maenas is not confined to the shore, and is often found in deeper water, well away from its usual haunts on rocky or sandy stretches near the tide line.

Although often thought to be inedible, it is a very tasty crab, and because some specimens can reach 30cm (12in) across the back, a large one is worth eating. The flesh is sweeter than that of the Edible Crab.

Normally, the size is only 15cms (6in) across the back, and for an aquarium you should select one only about 3 to 4cm (1.2-1.6in). Confine all those in a mixed tank to the same size, for larger crabs will always try to eat smaller ones.

2 Edible Crab

Cancer pagurus frequents the same sort of area as does the Shore Crab, but extends into far deeper water, and rockier sections of the coast.

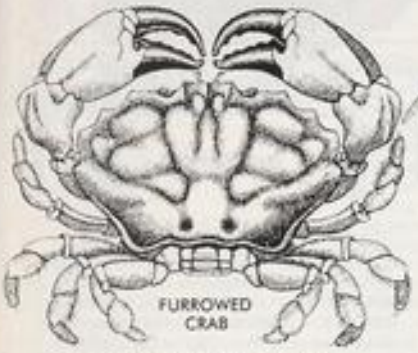

EDIBLE CRAB

When large enough foe the difference to be seen, it will be noticed that the pincer claws of the Edible Crab are black, and contrast well with this crab's reddish brown colouring.

3 Furrowed Crab

Xantho florida is something similar to the Edible Crab, but differs in having a much heavier-looking, furrowed carapace and front claws than does the other. In addition, it never grows larger than about 5cm (c2in) across the back, with claws that are much longer than this.

The colouring is about the same, and a half-grown specimen is an ideal inmate for a mixed marine aquarium; so long as care is taken to see that the other inmates are



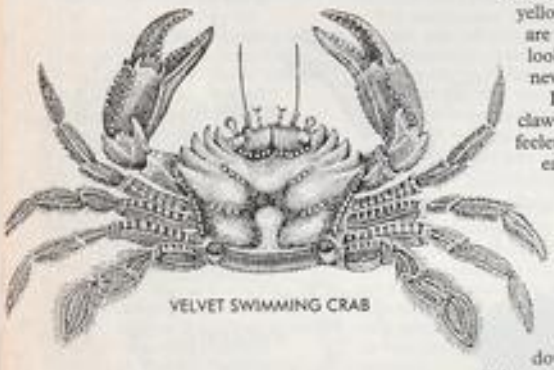
FURROWED CRAB

not too small, for it is pugnacious.

Normally, the Furrowed Crab frequents our south and west coasts, but I have found some specimens farther north in Britain. They are often hidden under stones near the lower tide marks.

4 Velvet Swimming Crab

Portunus puber is sometimes called the Fiddler because of its habit of holding one claw slightly across the other. Although it can be classed as a shore-line crab, it is



VELVET SWIMMING CRAB

really happier in deeper water, and if your marine aquarium is mainly pool and very little rock, then this crab would be suitable.

I have usually found my specimens with the aid of a hoop net used near rocks while sitting in a position that overlooks a clearing in the many rocks below; any water a meter or more deep will do.

The rearmost pair of legs of all the swimming crabs is flattened to a paddle shape, slightly enlarged, and edged with strong long hairs, while the other three pairs of legs are also well whiskered. By this means the crabs can swim through the water very easily.

The Velvet Swimming Crab is reddish brown, with many smart blue markings, and a small specimen is an asset in any marine aquarium, although it will be very pugnacious.

VARIEGATED SWIMMING CRAB

5 Variegated Swimming Crab

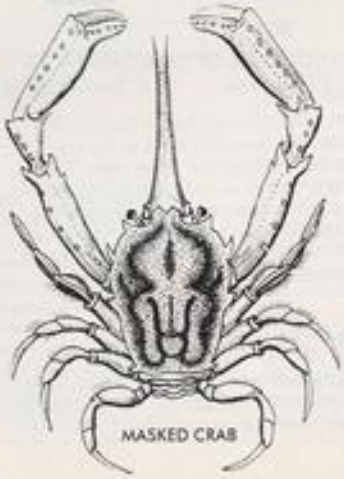
Portumnus variegatus is very pale purplish-white, mottled with darker shades. It is surprisingly beautiful to look at, for its carapace is evenly granulated all over its otherwise smooth heart-shaped surface, and a small specimen can be a delight. However, it is not common, except in parts of the south and west.

6 Masked Crab

Corystes cassivelaunus is a different kind of crab altogether, for its body is longer from head to tail than it is wide. The colour is reddish brown, passing to a yellowish white, and on the carapace are markings that are reputed to look like a face, though I have never been able to see that.

In addition, it has very long front claws, and also two long straight feelers, which are feathered nearest each other, and join together to form a breathing tube for when it is buried in the sand.

There is another peculiarity: a Masked Crab dropped into clear water over sand will at once start to sink into the sand by gripping with its hind legs, and pulling itself down. Within a few moments, it will be out of sight, ready for its next meal, which it grabs with its otherwise concealed front claws.



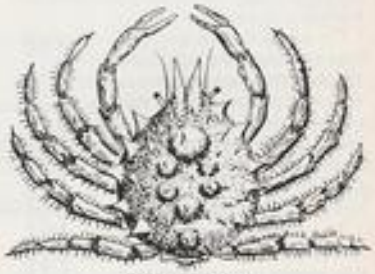
MASKED CRAB

It will be obvious that in an aquarium this species must have a stretch of deep sand well covered with water. Sand for this purpose, brought from below the lower tide mark, must be carried in a special container that is always kept full of seawater, and soon after it is put into the aquarium it will be seen that you have also brought many kinds of small marine creatures. These will serve as food, unless they are sufficiently quick to avoid capture.

7 Spinous Crab

Maia squinado is often referred to as the Spinous Spider Crab, and is found in fair abundance at times around our south and west coasts. It is reddish in colour, marked with brown, pinkish, or even yellow.

Its roughly round shape, covered with

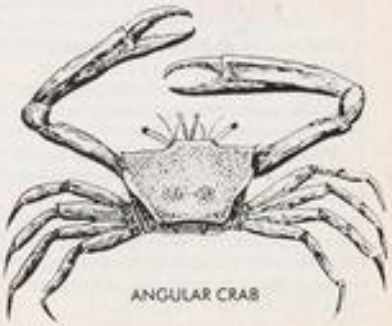


SPINOUS CRAB

spines, makes it fairly easy to recognise, and the small front claws indicate that it is comparatively safe with others of its own size. These crabs can be obtained from about 5cm (c2in) across the back, and form a good contrast in shape to any others you may have.

8 Angular Crab

Gonoplax angulata is another contrast in shape to normal crabs, for as well as the queerly shaped carapace, it holds its long front claws at an angular attitude. It is a dull yellowish red, and the male's moving part of its claw is black.



ANGULAR CRAB

It can be obtained around Wales and the southern parts of England, as well as occasionally elsewhere, except on the east coast. Normally, it is found only in deeper water, but there have been instances of it being found in estuaries.

9 Broad-clawed Hairy Porcelain Crab

Porcellana platycheles is a small crab that is worth securing for collection. It is very small, only 2cm (0.8in) across the back, so you would have to provide a special area

HAIRY PORCELAIN CRAB

for it. The colour is reddish brown above, but paler and yellowish below, while the many hairs are brown.

There is another real peculiarity in its legs: the front pair are twice as long as the body is wide, with tremendous claws, flattened above. The rear legs, however, are vestigial, and are so easily overlooked that the crab appears to have only four pairs of legs.

This crab can be found all around Britain, and the largest specimens come from the north. If you hold it by one of the claws, it will at once cast that claw to escape. Despite its size, beware of those claws... they bite hard!

10 Longlegged Spider Crab

Macropodia phalangium has a small triangular body and very long legs. In some areas it has taken to decorating its body with pieces of sponge, and similar pieces of weed, so that it is well camouflaged.

This is a timid crab, often called a spider by fishermen, and needs protecting from larger crabs and fish that could engulf its body in one bite. The spines it has all over its body do not seem to discourage its predators.

In a marine aquarium with the previous Hairy Porcelain Crab, it would be most attractive.

11 Scorpion Spider Crab

Inachus dorsettensis is also a small crab, being only 2cm (0.8in) across the body, but it has a difference in that its second pair of legs is tremendously long.

It was first described from Dorset, hence the name, but now it has been found all around the south and west, and in Ireland, and there are records of it being found much farther north. Its triangular body has three big lumps on its rear, complete with a spine each.

LONG-LEGGED SPIDER CRAB

SCORPION SPIDER CRAB

Feeding Tips

Food for all these crabs is about the same. They will eat any animal meat they can get at easily, and, conversely, they serve as food for most fishes in the sea. They will take raw fish and raw meat, with a preference for fish.

They will also attack and eat any smaller crab or shrimp they can catch, as well as any other small sea creature.

The main trouble about feeding crabs is the amount they leave behind. This necessitates regular water changes and good filtration.

Handling a live crab is relatively easy if you follow these guidelines: using a stick in one hand to distract the claws, use your other hand to grasp the creature across the back of its body, near the front. On most crabs, this is usually at the widest part of the shell. Make sure your grip is firm, and you will be quite safe to examine it properly.

With practice, you will not need the use of a stick for the claws, but at first, take great care. AP

Top spitter of the aquatic world: the Archer Fish.

LARRICK PARKS

Accurate spitters

Mangrove-dwelling Archer Fish normally feed off flying insects and the like that fall into the water from the air or surrounding mangrove vegetation.

But, with their large eyes forever turned skywards, Archers are also always on the lookout for unwary tasty morsels that land anywhere near the water surface. When they spot a suitable titbit, they simply shoot it down by spitting jets of water at it with such force that the impact will knock the insect off its perch and into the water. One almighty gulp later, the insect is gone.

The Archer's aim, while not perfect, is good enough, as evidenced by the large shoals found in the wild mangroves of Asia and North Australia.

Remarkable though the shooting down of food may be, it would be impossible to achieve without this fish's amazing ability to compensate for the refraction (bending) that occurs as light passes from air to water. Archer fish therefore shoot 'out of true' ... and hit the target with monotonous regularity.

The maximum distance recorded for an Archer shot is 5 feet (around 150cm)! Not bad for a fish that grows up to a maximum of 10 inches (25cm).

NEW SERIES

PONDERINGS

Alex Stephenson kicks off our brand-new series of personal insights, views, anecdotes, experiences, notes and tips for the pondkeeping season with his thoughts on waterholes, outdoor 'aquaria' … and much else besides.

Illustrations by the author

Garden ponds are more popular than ever, possibly because the more water you have to play with, the less grass you have to cut! Many people reading this will already be experienced 'pond managers', and some may even be contemplating further water works. Others will be planning their first pond.

I've chosen the term 'pond manager' intentionally because good management is essential if the pond is to provide a healthy environment for ornamental plants and fish.

Waterholes

I don't intend to discuss here the complexities of the specialised Koi pond; there are many other writers far better qualified on this subject. So, if Koi keeping is your main intention, you will need specialist advice.

A degree in hydrodynamics is also useful (joke)!

The sort of pond we are talking about here is the ornamental waterhole in the garden; not a re-creation of the Everglades, just a volume of water to contain such things as water lilies, submerged plants, marginal plants, and an assortment of fish.

Many books have been written which include chapters on pond design. My advice to anyone about to dig a hole is: Stop! Before sticking a spade into the ground, read one or more of these books. A badly designed pond can, and will, give you endless problems. The time spent on absorbing some basic knowledge such as "volume-to-surface-area-ratios" will prove to be the most important part of the project. Besides, you can impress your friends with it.

Unnatural ponds

A lot of people are under the impression that a man-made pond is a natural environment and can be left to look after itself. This is just not so. If you think of your pond as an outdoor aquarium, you'll be nearer the truth.

For example, a natural pond constantly loses water into the ground, taking with it a lot of waste products. This water is replaced by rain and run-off water, and so a steady water change is going on all the time. Plants root directly into the bottom and can grow unrestricted, using up and converting compounds produced by the animal life.

If you are fortunate enough to own a natural pond, the best way to manage it is to interfere as little as possible. Not so the man-made version.

When we make a waterhole, the first thing we do is line it to prevent water escaping. This lining, whether it is concrete or plastic, effectively stops waste products from soaking away into the ground. It still rains, of course, and this helps dilute the soup, but sooner or later, a part change of water will be necessary. Plants still play an important role in the artificial pond, but they are usually restricted. The practice of planting in containers for easy maintenance sees to that. Also, as most people like to see their fish occasionally, pruning becomes a regular practice.

Then there are stocking levels. We all like to see lots of colourful fish, and we all stock our ponds with more weight of fish than would occur naturally. This recipe for eventual disaster can only be supported by good management. Meaningful negotiations with next door's cat is also advisable!

Essential do's

So what are the things we need to do? Part change the water once in a while; cut back and remove decaying vegetation regularly; observe fish for signs of problems; feed good-quality fish foods, and feed properly.

When fish are "eating their heads off", feed small amounts often. When they are "half-hearted" about food, don't feed at all. Always remove any uneaten food. In hot sunny weather, if the pond doesn't have adequate shade such as lily pads, provide shade.

Strip-down

If you are into gadgets such as pond vacuums, sediment can be removed on a regular basis. If not, sediment is best left undisturbed until the time comes for a complete clean-out.

"What complete clean out"? I hear you ask. Yes, I'm afraid a total strip-down is needed from time to time. With a large pond, well maintained, every three or four years may be sufficient; longer perhaps if a vacuum cleaning system is regularly used. For smaller ponds, particularly if stock levels are high, I'm sorry to say that it's usually once every year.

What I do is this: before winter sets in, around early October, I remove the fish I can catch and begin emptying the pond. I am fortunate to be able to siphon out most of my pondwater. While the level is going down, I remove all the plant containers. These are put to one side under a plastic sheet so they don't dry out. When the water level is down to a few inches, I catch the remainder of the fish.

The next bit entails getting into the hole with a bucket and shovel to get out the silt. A hose is rigged up and the sides scrubbed and washed down using a stiff brush. The resulting mess is removed with the help of a dustpan and brush (invaluable items).

Refilling starts immediately with the hosepipe. Meanwhile, the plant containers are attended to. For submerged aquatics and marginals, I chop everything down to a couple of inches. It will only die off and rot during the winter anyway. For water lilies I remove all old growth, leaving only the shorter immature pads and shoots. Any splitting and re-potting is done at this time for convenience, even though spring is considered the best time to split lilies.

As plant baskets are completed, they are returned to the pond. When full, a dose of water conditioner is added and the

They say his next effort is to be a replica of Angel Falls.

pond is left overnight. The following day, after checking temperatures, in go the fish.

I can now safely leave everything to "wind down" for winter. I don't use pond heaters or aerators; nor do I make holes in the ice. I do sweep snow off the ice to let the light in, but that's all. A clean pond, having little to decay and cause pollution is, I think, the best policy for winter.

In spring, once the fish are "up and about", I do a half water change; simply siphon out half, and top up slowly.

Spring and fall

Spring and autumn are the times you can expect health problems, changing conditions creating the opportunity for disease organisms to get the upper hand. If fish are sick, try to diagnose the problem and treat accordingly. Not as easy as it sounds. I am convinced that many fish die of treatment, rather than disease.

The normal rules of fishkeeping, such as precautionary care of new stock, apply to ponds just as much as indoor aquaria. I have known people who religiously quarantine new fish, but quite happily install new plants without any precautionary measures whatever.

Many plants, particularly marginals, are nursery grown by professionals and should be relatively safe. Some others, especially the so-called oxygenators, might be collected from natural waters in some countries and, if so, must be regarded as suspect.

I once purchased a hundred bunches of 'Crispa' (*Lagarosiphon major*) to add to a *Daphnia* pond. Fortunately, I had the sense to float these in a container for inspection. I have never seen so many *Hydra* in my life! They are interesting creatures, but they live on such things as *Daphnia* and fish fry; so do be careful with plants.

'Unique' ponds

Those readers who have more than one pond already, will be aware that they are all different in character; fish grow well in some and not in others; some 'green up' easily, while some hardly ever have this problem; day time and night time temperatures may be found different etc.

Much of this is due to initial design, but not all of it. The fact is that all ponds are peculiar to themselves, so every one you create will be unique.

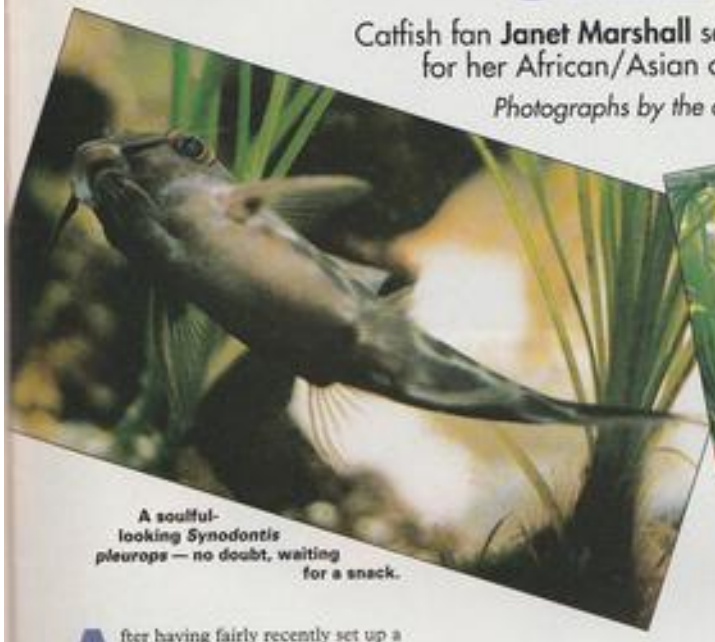
For those getting involved for the first time, I hope all of this has not dampened your enthusiasm. Few things can give so much pleasure, for so many years, with so little effort than a good pond. So read the books, plan your pond, dig the hole, and enjoy playing with water!

FIRST STEPS

Two African COMMUNITY CATS

Catfish fan **Janet Marshall** selects two Synos for her African/Asian community.

Photographs by the author



A soulful-looking *Synodontis pleurops* — no doubt, waiting for a snack.

Overall view of my African/Asian tank ... without a single cat in sight!

After having fairly recently set up a South American catfish community tank, I was eager to try some African cats. I had a spare aquarium where some of my South Americans had been living — a twenty-gallon tank measuring 26×16×16 in. (66×40×40 cm) and decided that, owing to existing fish stock, the tank would have an African/Asian theme.

The non-catfishes consisted of a pair of Lace Gouramis, four Pearl Danios and a pair of *Anomalochromis thomasi* (Dwarf African Jewel or Butterfly Cichlids) which are very peaceful and become territorial only when spawning. They are ideal for a smallish community tank, as the male is fully grown at four inches (10 cm) with the female slightly smaller at about three inches (7.6 cm). They are substrate spawners and will lay their eggs on a flat stone placed in the tank.

The tank was well planted with *Anubias lanceolata*, *Vallisneria*, Cryptocorynes and other plants, all of which seemed to be growing very well. I added plenty of bogwood arranged mainly towards the back of the tank, caves — both natural and synthetic — and some smooth pebbles arranged in the foreground between the plants.

Care should be taken when choosing rocks or stones for the catfish aquarium as these fishes, particularly the scaleless types, such as Synodontis, can easily injure themselves on sharp decor.

Upside-down choice

I had already decided to keep some Upside-Down Catfishes (*Synodontis nigriventris*) as these had always fascinated me. This, however, was easier said than done, as I often find that having decided to keep a paricular type of fish, they appear suddenly to become extinct! Eventually, I tracked down some rather sorry-looking specimens — very small and thin — and decided to take a chance and purchase three.

They have, in fact, developed very well indeed and, in two or three months, have easily doubled in size. They feed very well on a diet of catfish tablets, chopped prawns and frozen live foods which include mosquito larvae, *Tubifex* and gamma shrimp, and often swim out of their shelters during the daytime, hunting for food.

Although these fishes are best known for their amusing habit of swimming in an inverted position — normally to enable them to browse underneath vegetation for insect larvae in the wild — they quickly resort to swimming the right way up when offered food at the bottom of the rank.

Upside-down cats are ideal for either a specialist or general community tank, as they only grow to about three or four inches (7.6-10 cm) in length and are compatible with most other fishes. They are best kept in small groups, as they enjoy the company of their own kind.

Misleading big-eyes

Once I was confident that the Upside-down catfishes had settled in and were healthy, I decided to add another type of *Synodontis*. Having poured over books and articles, I made a list of suitable smallish species and went to try and find some. Again, not easy ... I couldn't find any on

my list, with the exception of one which would have needed a bank loan to pay for it!

I asked the advice of the shop owner and was recommended to buy two *Synodontis pleurops* (Big-Eyed Catfish) as they were peaceful and did not grow too big.

Peaceful they certainly are, and very attractive, with huge, soulful eyes and marbled markings which will apparently fade once they are past the half-grown stage. Small, I don't think they will be, after having checked my books and found that they can grow to a foot in length (30 cm)! At least, for the time being they are gentle, charming and very visible, as instead of hiding away, they prefer to 'hang' on to the bogwood or the side of the tank.

They have quickly learned the times when a feed is imminent and position themselves at the front of the tank, eagerly awaiting their meal. Their diet is the same as that of the Upside-down Catfishes, but their growth rate is somewhat more alarming. They have grown a good two or three inches (5-7.6 cm) since I have had them. Only time will tell whether or not they will reach their full size potential, but I think it may be time to start thinking towards acquiring a larger tank.

Peaceful, but greedy — my two Butterfly Cichlids (*Anomalochromis thomasi*).

Tank details

My tank is filtered by a Fluval 203 external power filter packed with ceramic rings, Efifix, Siporax and filter wool and has a diffuser attached to an extension tube from the outlet, instead of a spray bar, to create less turbulent areas for the Gouramis and also to add extra aeration to the tank.

The filter itself is cleaned every six weeks by replacing the filter wool and gently rinsing the bottom three layers of media with aquarium water, in order not to destroy too many of the beneficial bacteria which would have built up within the media themselves.

Heating is maintained at 25°C (77°F) which was initially raised to 27°C (c 81°F) when the *Synodontis* were first introduced to the aquarium, as young, newly established Synos can be prone to White Spot and warmer temperatures can help alleviate this until the fishes settle in and begin to grow.

Because of the other fishes already in the aquarium, the heater was adjusted only by about half a degree a day until the desired temperature was reached in order not to cause any stress to the inhabitants. I also added heater guards to the heaterstats as *Synodontis*, being scaleless (they are commonly known as 'naked catfishes'), can rest against a heater and easily burn themselves.

Each week I undertake a 20% partial water change and ensure that the gravel is well 'hoovered'; at the same time, any dead or dying plant leaves are removed. Regular water tests show that nitrite and ammonia are nil, nitrate is around 50 ppm and the pH remains constant at 7.4.

One of my Upside-down Cats hovering in typical pose over the food 'bowl'.

All in all, I am very pleased with this set-up. The non-catfishes are all attractive and give plenty of movement during the day and, more importantly, both catfishes and non-catfishes appear to get on very well together — although it must be said that the Gouramis and Thomasis are extremely greedy and, even after 'lights-out', manage to find the catfishes' food, despite having just been fed themselves a little earlier. AKP

The Goodeid R
Selected Highlights PAR

Derek Lambert rounds off his two-part look at these interesting livebearers with his personal choice of hardy and challenging species.

Photographs — unless otherwise indicated — by the author

This month I am focussing in on a range of Goodeid species to show the wide diversity that exists within this fascinating family, going from the first Goodeid imported to UK, the Butterfly Goodeid (*Ameca splendens*), to the most difficult of all the species, Turner's Sailfin Goodeid (*Hubbsina turneri*).

1 The Butterfly

Ameca splendens occurs in the head waters of the Rio Ameca. Most habitats where they are found are clear flowing streams and springs, with some plant growth at the banks. Unfortunately, a number of exotic species have been introduced into these habitats and all the native species are now in serious decline or have already become extinct.

The species name of the Butterfly Goodeid was derived from the beautiful colours of the mature male. Over much of the body there are iridescent scales of green and blue which shimmer in the sunlight. The caudal, dorsal and anal fins are edged in bright yellow, offset by a black band inside.

Aquarium care of this species is relatively straightforward. Amecas like a large, well filtered aquarium maintained at approximately 72°F (22°C). Some areas of heavy plant growth are appreciated.

Their diet should contain a wide variety of foods, but they will breed successfully on an exclusive diet of a good-quality flake food if nothing else is available. Broods are born on a six-week cycle during the summer months, but can become erratic during the winter or as the female ages.

Amecas can be successfully bred in a colony situation once the adults become used to small fry in the aquarium.

Many of the Goodeids which occur in flowing water or large lakes can be dealt with in a similar fashion, although most will require the addition of live foods to do well in aquaria. These include most members of the following genera: *Chapalichthys, Goodea, Ilyodon, Xenoophorus, Xenotaenia* and *Xenotoca*.

2 Golden Darters

The next species I have chosen to focus on is the Golden Darter Goodeid, *Allodontichthys zonistius*. This species is found in streams in the Rio Armeria and Rio Coahuayana systems. These streams are very different from the Butterfly Goodeid habitats, being relatively shallow with a series of interconnected pools during the dry season. During the rainy season, however , they become raging torrents.

These conditions mimic those in which the North American Darters live, and some of the same adaptations have been adopted to overcome the problems associated with them. The most important physiological adaptation is a reduced swim bladder which enables Golden Darters to hug the bottom of the stream more easily.

A behavioural adaptation, which makes them very difficult to catch in the wild, is living by, or under, stones in the shallow parts of the stream.

Recreating these conditions in the aquarium would obviously be very difficult, but fortunately, this species is a little more accommodating than that. All it really needs is clean water (surprisingly, water movement is not essential) and a large tank with plenty of hiding places.

A rock-strewn bottom similar to a Malawi set-up is ideal, but Golden Darter Goodeids will settle just as easily in a heavily planted tank. In such conditions, they spend much of their time hiding near the bottom. Each fish seems to stake out a territory, with the weakest fish in the group being forced to live in the upper corners if the tank is not large enough to accommodate all the inhabitants.

The diet of this species is more demanding than that of the previously mentioned ones. They only seem to thrive when live food is included on a regular basis. My own fish receive a feed of live food every day, as well as flake food.

Another difference between this species and those previously mentioned is that they generally cannot be colony-bred in any number. A few hours after birth, the fry move to the surface of the aquarium, where the adults will usually pick them off unless heavy plant cover is provided. Therefore, I remove the fry as soon as I see them and rear them separately.

All members of this genus that I have worked with can be handled in the same way. I have not worked with the Whitepatched Darter Goodeid, *Allodontichthys hubbsi*. However, Dolores I. Kingston reports that this species is solitary and that males will kill each other and females, if confined to small aquaria. This would be consistent with, although a little more extreme than, the behaviour exhibited by other members of this genus.

3 Bumblebees

The Bumblebee Goodeid, *Allotoca dugesi*, has a relatively wide distribution in Mexico, but is normally found in still to slow-moving waters with heavy plant growth. Under such conditions, it can usually be found in large numbers, particularly among the roots of floating plants, such as Water Hyacinth.

Despite occurring in some quite foul conditions in the wild, *Allotoca dugesi* seems to be particularly sensitive to water conditions in the aquarium, with large, regular, partial water changes being required to keep them in tip top condition. Although filtration is appreciated, strong currents should be avoided, as this is essentially a still-water species which tends to fade away if it has to fight against a current all the time.

Ideally, the aquarium should have plenty of cover available as hiding places and the species is happier if maintained in a large shoal. Single pairs often die within

DENNIS BARRETT

Left, *Girardinichthys multiradiatus* is one of the most difficult species of Goodeid to maintain in captivity. Adult males develop the most beautiful golden coloration in the dorsal and anal fins.

Below, the Bumblebee Goodeid appears to be particularly sensitive to water quality. This is a female. For a photograph of a male see Part 1 published in April '94.

Bottom right, Crescent Zoe — male.

Bottom left, the Golden Darter Goodeid lives in conditions very similar to many of the North American Darters and has evolved adaptations similar to them such as a reduced swim bladder and bottom hugging lifestyle.

Below, far right, Turner's Sailfin Goodeid is most unusual in that it has a cichlid-type dorsal (back) fin. It is also the most difficult species to maintain in tip-top condition.

Review

T 2

a matter of months, despite otherwise ideal conditions.

Diet for this species should once again contain some live foods, but regular feeds with a good quality flake food also seem to be essential to their well being. They have tremendous appetites and will eat as often as food is available.

Broods are born every six to eight weeks and can number over a hundred small fry. However, mortality rates in such large broods are usually high and the small fry often make poor-quality adults. Such large broods are usually born to big old females, whereas, young females produce smaller numbers of better-quality fry. For this reason, I try to breed from stock which is 6 to 8 months in age. Once used to small fry, this species can be colony-bred.

Like the Bumblebee Goodeid, most members of this genus can be treated in this way, as can those in the following genera:- *Characodon*, *Skiffia* and *Zoogoneticus*. The Amarillo, *Girardinichthys viviparus*, can also be dealt with in the same manner. Most of these species occur in still to slow-moving water with heavy plant growth.

4 Golden Sailfin

This species is one of the real problem Goodeids. The Golden Sailfin Goodeid, *Girardinichthys multiradiatus*, has been collected on a regular basis since the early 1970's, and yet it has only very rarely been maintained in the long-term by a few aquarists.

It is found in ponds and slow-flowing streams to the north and west of Mexico City. Many of its natural habitats have dried up or become too polluted for fish to live in, but man-made pools created for irrigation and fish farming have become new habitats for this species.

Golden Sailfin Goodeids are aggressive towards members of their own kind. In small aquaria, this aggression can lead to the deaths of all but one male and, often, all the females as well. For this reason, a large aquarium with plenty of cover is needed if any success is to be had. This should have filtration of some kind, but a strong current is not appreciated, so power filters should be avoided.

Dietary requirements include plenty of live foods, especially brine shrimp. Heavy feeding helps to reduce aggressive behav-

THE ZOES

In the past, *Zoogenitticus quitzeoensis* was considered a very difficult species to work with in the aquarium. This was because brood sizes tended to be small (average 15) and often consisted of weak fry.

Yet, when fed on a diet containing plenty of live food without the recommended additional vegetable matter, brood sizes of 30+ robust fry were obtained, even from the small 'Yellow Morph'.

The new Crescent Zoe will also produce broods of up to 40 young on this type of diet. Because of this new species' fecundity, peaceful temperament and attractive colours, it has become one of the most popular Goodeids in the hobby today.

Juvenile *Ameca splendens* males show only a hint of the gorgeous colours they will have as full grown adults. This species is in serious danger of extinction in the wild.

iour, particularly towards the sub-dominant males.

Broods are born somewhat erratically and can number 50. Once again, better-quality fry are produced by younger females. Gravid females are best removed to a maternity tank for the later part of their gestation. Once the fry are born, the female should be given a few days recuperation before being returned to the adult tank. As with some other species it is possible to colony-breed Golden Sailfish Goodeids.

5 Turner's Sailfin

The final species I have chosen to represent this fascinating group of fish is Turner's Sailfin Goodeid, *Hubbsina turneri*. This species is the most difficult of all the Goodeids to maintain in captivity. It is also one of the most bizarre, with a dorsal fin which looks for all the world like a cichlid dorsal. In many ways, this is the fish mother nature put together out of all the bits left over!

For a number of years, Turner's Sailfin Goodeid was thought to be extinct. The reason for this was that it only occurs in low numbers in the wild, and the adults were usually hiding among the stones or in the heaviest plant growth, so none were caught when a seine net was used. Pat (my mother) and I caught three small fry of this species in 1989 and were later able to establish its widespread distribution throughout Lake Zacapu and the surrounding area.

DENNIS BARRETT

An Amanillo pair mating. This photograph clearly shows the degree of co-operation needed between the pair.

In the captivity this species is, basically, nocturnal in habit, spending much of the daylight hours hiding among the thick cover at the bottom of the tank. This cover consists of pots, rocks and plants in my set-up. They are also territorial and stake out their own patch, chasing off any other fish which venture into it.

They feed exclusively on livefoods and behave like a typical 'ambush predator', gobbling up any food which swims by. This usually consists of brine shrimp and bloodworm, but they will eat anything if it is small enough and wriggles.

Broods are born every six to eight weeks during the summer months, but rarely are any fry produced during the winter. The fry are about 5mm long at birth and move straight up to the surface and hide among the plants. Unlike the adults, they tend to congregate in a shoal close to the heaviest plant growth. The adults usually leave the fry alone if they are well fed.

As the babies grow, they move lower down in the water and, as they become sexually mature, they fight it out for a territory among the bottom cover. In over-populated aquaria, the weakest fish are forced out into the open and slowly die off.

The few species which I have discussed above, are but a small selection to illustrate the diversity that exists within this fascinating family of fishes.

Many species are relatively simple to maintain in the aquarium, providing a few simple guidelines are followed. Within the family, however, are a number of species which present a real challenge to the aquarist who has already bred many of the easy specfies of fish ... such as Discus! AKP

WANT TO KNOW MORE?

For information about the Livebearer Society, **Viviparous** Contact: **Mrs A. Fearnley, 43 Lamb Lane, Monk Bretton, Barnsley, Yorkshire.**

FURTHER READING

Dawes, John, (1991): *Livebearing Fishes — A guide to their aquarium care, biology and classification.* **Blandford Press.**

Miller & Fitzsimons, (1971): *Ameca splendens*, a new genus and species of goodeid fish from western Mexico, with remarks on the classification of the Goodeidae. *Copeia*, **No. 1**, pp. 1-13.

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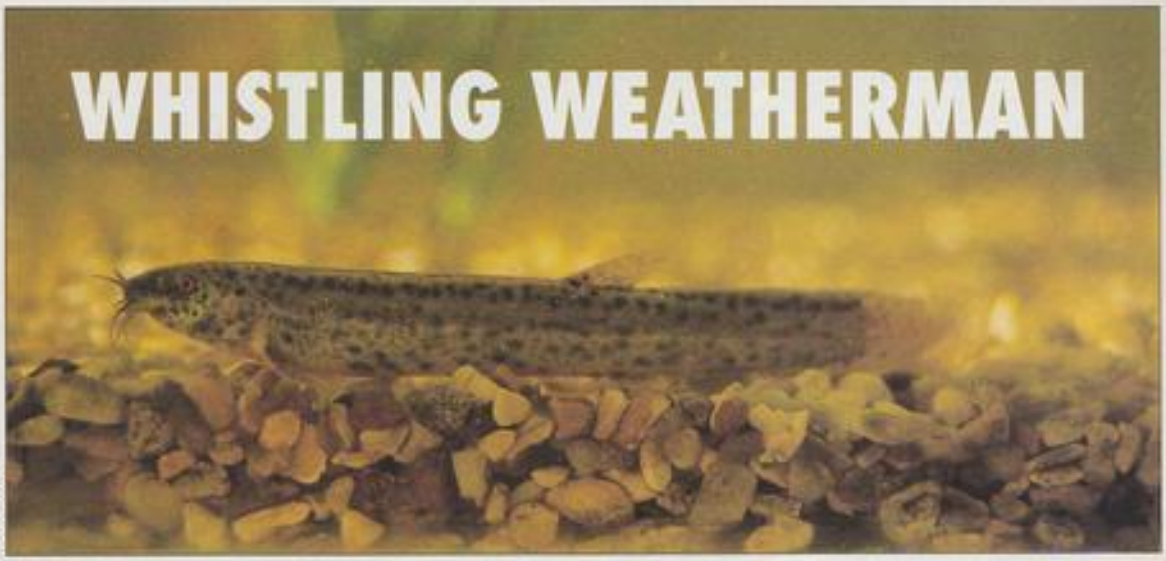
WHISTLING WEATHERMAN



GARETH EVANS

It may not be spectacular, but what the Weather Loach lacks in looks, it more than makes up for in unusual behaviour.

Talk of coldwater fish and the images which spring most readily to mind are the child with the Goldfish bowl, or the enthusiast seeking the perfect Koi.

While the unheated freshwater aquarium may not boast the showy, living jewels available to its tropical counterpart, it can still host one or two oddities which should satisfy anyone looking for something just that bit different. *Misgurnus fossilis*, the Weatherfish, or Weather Loach, is one such contender.

The Weather Loach is well known for its ability to 'predict' barometric changes. But did you know that it can also 'whistle' in a most unusual way? **Dr. Gareth Evans** reports on this remarkable fish

Vital statistics

Like the members of the Loach family, the Cobitidae in general, the Weatherfish is characterised by a smooth, elongated, cylindrical body, with minute scales set into its skin. Growing to between 20-30 cm (8-12 in) in the wild (though often less in captivity), it is one of the largest fish of its kind.

The long, ribbon-like body is yellow or brownish, with black longitudinal markings along its length, and the underside is yellow or orange in colour. The head is blunt, the downward facing mouth being surrounded with 10 sensitive barbels.

In the wild

With the exception of Britain and Scandinavia, this fish is found almost throughout Europe, from France eastwards to the Volga. It usually frequents lakes, pools and the still parts of the lower reaches of slow-flowing rivers.

Throughout the day, the Weather Loach remains hidden, buried in the mud, or lurking in areas of heavy weed growth, its natural coloration acting as perfect camouflage, and emerging, as night falls, to search for food. As the barbels and the position of the mouth suggest, this is a bottom feeder, seeking small crustacea, invertebrates and other edible material in the substrate.

Breeding takes place in the spring, usually April or early May, when the female sheds several thousand, sticky-surfaced eggs onto a dense mat of vegetation, often in fairly secluded and inaccessible places.

Some two weeks or so later, the eggs hatch, the young having the rest of the summer to feed and grow, before joining the adults to over-winter in relative inactivity in the bottom mud.

Though they have a fairly long potential lifespan, possibly reaching an age of 4 or 5, Weather Loaches frequently feature in the diet of large predatory fish, especially the European Catfish, *Silurus glanis* — which accounts for their widespread use as bait by anglers seeking this latter species.

Gut breather

One of this animal's chief claims to fame is its rather unusual emergency breathing method. In conditions of reduced dissolved oxygen levels, which often occur in the stagnant waters the Weatherfish frequents, it copes by using the rear part of its gut as a form of lung.

Rising to the surface, it gulps a bubble of air, which travels to the hind end of its intestine, where it is absorbed into the bloodstream. At the same time, it releases surplus air, from which the oxygen has already been removed by this process, from its anal opening, with a characteristic whistling noise!

Considering the likelihood of such oxygen deficiency in ponds, particularly in the summer, with both the threat of drying out and the warmer water naturally holding less oxygen than when cold, it is a pretty effective, if somewhat strange, survival measure.

In captivity

In the traditional coldwater aquarium, the Weatherfish will manage well, acting as a sort of biological vacuum cleaner, scavenging the food left over by the other inhabitants.

Though they do not often reach their full 'wild' proportions in captivity, they may commonly be 15cm (6in) or more in length. Despite this, they seem happy to co-exist perfectly amicably with the other denizens of unheated tanks, with which their muted colours and differing body shape provide an interesting contrast.

While a soft substrate will best mimic their natural surroundings and enable them to burrow in their habitual fashion, the resultant clouding of the water caused by these activities is not very attractive, particularly in a mixed tank. A gravel bottom, with areas of weed, is therefore probably a better alternative, as the loaches can still hide during the day, without stirring things up.

By day, these fish are hardly the most dynamic of aquarium subjects, but the

use, after dark, of a simple table lamp equipped with a red bulb will open up their nocturnal world for view (they seem fairly insensitive to light of this colour). In this way, their night-time foraging can be watched, as these generally sedentary beasts take on a much more active role.

Barometric fish

It is unlikely that the air-breathing behaviour of the Weather Loach will be observed in the aquarium, as the conditions required to evoke this response would not be very healthy for the other members of the community.

However, it is often possible to see an allied facet of this unusual animal — the one accounting for their common name. For reasons believed to relate to the Weatherfish's uncommon oxygen requirements, it is particularly sensitive to fluctuations in atmospheric pressure.

Accordingly, when a sudden barometric change occurs, the fish abandons its normal position on the bottom in favour of a restless patrol round and round the walls of its tank, occasionally rising to the surface. It was this natural ability to forecast the weather that earned the animal its name, and certainly adds something to its appeal as an aquarium subject.

Not even the most ardent Weather Loach fan could, in all honesty, describe this fish as particularly beautiful. However, those seeking beauties are well served by other species. In many ways, this creature's appeal lies not in its conservative colours or functional appearance, but rather in its oddity value.

If something out of the ordinary is what you're after, then look no further. This biological curiosity, with its nocturnal habits and fascinating adaptations to its way of life, is well worth consideration for any coldwater collection. AAP

TREVOR McDONALD

Close-up of a most remarkable fish.

QUESTION TIME

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Each query receives a personal answer and, in addition, we will publish a selection of the most interesting questions and responses each month. *Please indicate clearly on the top left hand corner of your envelope the name of the experts to whom your query should be directed.*

All letters must be accompanied by an S.A.E. and addressed to: Question Time, Aquarist & Pondkeeper, 9 Tufton Street, Ashford, Kent TN23 1QN. Herpetology, Julian Sims. Koi, John Cuvelier. Tropical, Dr David Ford. Coldwater, Pauline Hodgkinson. Plants, Barry James. Marine, Gordon Kay.

TROPICAL

JOHN DAVIS

All freshwater crabs are beautiful and can be quite hardy. They do pose a potential threat to fish, though.

Crab info search

I recently bought two freshwater crabs but can't find any information on them. Can you help?

There are hundreds of species of crabs, especially tropical ones, that can be kept in the freshwater aquarium. However, it is always a risk to place these in the community tank with fish. Crabs are scavengers, but can be predators as well; a sleeping fish within reach of the claws becomes just another nocturnal meal.

These decapods (a term referring to the five pairs of walking legs) will feed on fish foods, scraps of fish and shellfish. During growth, they cast their outer shell and it looks initially as if there are two crabs ... leave the old shell as food.

There is little or no information in the hobby literature on species. You will therefore need to refer to the biology sections of the public library or the nearest University/College reference libraries.

Stressed Discus

I recently purchased eight Blue Cobalt Discus. I am keeping them in temporary accommodation while we are waiting to move house.

The tank is 30×12×15in. It is filtered by a Fluval 203 external power filter and a Fluval 2 internal filter fitted with a spray bar. The water chemistry is pH 6-6.5, Ammonia 0, Nitrite 0, Nitrate low and the hardness is 1° KH. I make weekly 25% water changes of the same chemistry. I also use Waterlife 6.5 buffer.

The problem is that three of the Discus have ceased to feed as though they're on 'hunger strike'. The remaining five are feeding well. One of my 'hunger strike' fish has recently begun passing white, stringy faeces. Is this due to stress or lack of food?

Discus are sensitive fish and any changes in their home, such as adding new fish or moving tank, can bring on stress.

The lowest stress factor is a temporary hunger strike; the next is diarrhoea (seen by white stringy faeces, as you noted), then colour changes (we would go pale, Discus go black), then clamped fins and lying down, and, finally, death.

How far the fish go down this stress path depends on many factors. Since the majority of your fish are OK and the symptoms have stopped at the diarrhoea stage, they should recover.

All you can do is carry out lots of partial water changes to sweeten things up (the water chemistry looks good, but addition of rainwater may help) and avoid disturbing the fish in any way as long as possible. Adding chemicals or cures will not relieve stress.

PLANTS

Dying plants

I am having no success in growing plants. Introduced Swords may or may not grow a small amount and, then, only at first. After this, the leaves just get older and die.

I've also noticed plant debris which was left on the surface of the water for some weeks developed a luminous green colour on the leaves. There's also a fine green scum on the water surface.

The only plant that seems to be doing well is one with a pinkish colour on its leaves.

My lighting consists of a sunlight 500 Metal Halide (450 watts) suspended 32in above the gravel and 10in above the water. This light is on from 11am to 10pm. The temperature of the water is 20°C (68°F). The tank itself measures 68×18×24in (c170×45×60cm).

It would seem to me that your growing problems are related to your lighting. Your system is far too powerful for an aquarium. I suspect that the blue-green algae on the leaves reflects this excess light.

High illumination would also account for the pinkish coloured plants doing better than the others, as red-coloured plants need significantly more light than green ones.

I would use 3×80-125 watt HQL lamps on your system, suspended to within 6in (15cm) of the surface.

The other negative factor in your system is the temperature. This is too low for most tropical plants over an extended period; 24-26°C (c75-78°F) is more than the norm.

I assume that you fertilise your plants regularly and that you are probably using laterite as a substrate.

Non-flowering Hyacinths

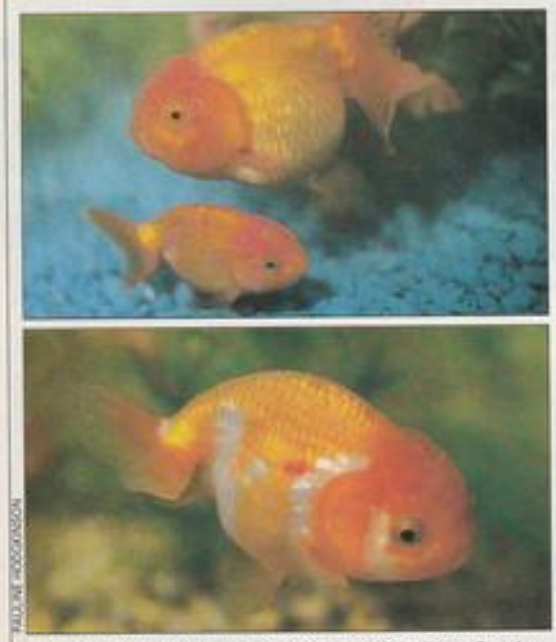
For two years running, I have bought Water Hyacinths from my local garden centre. The assistant assured me that they would flower in my pond, but so far, I have been unlucky. What am I doing wrong?

You are almost certainly doing nothing wrong. The assistant is mis-informed regarding this plant. It seldom flowers outside in the British Isles, except in the most glorious of summers! It does, however, flower in conservatory and greenhouse ponds.

BARRY JAMES

The exquisite bloom of the water Hyacinth (*Eichhornia crassipes*).

COLDWATER



Note the pronounced curve to the back exhibited by a Ranchu (above), when compared with the less pronounced profile exhibited by the two Lionheads (top).

Ranchu v Lionhead

What is the basic difference between the fish we know as the Lionhead and the Japanese-type Ranchu?

The most obvious difference between these two varieties can be seen in the contour of the dorsal-less back. The Ranchu — unlike the Lionhead, who ideally, should have a smooth curvature of its back — will have a "curback" or dip to the peduncle which will not allow the caudal (tail) fin to be carried or held at the same upright, fan-like, angle that Lionheads can.

It is interesting to note that there will often be some Ranchu-type fish in Lionhead spawnings.

Size problems

We have an 18 × 10 × 10in tank in which we keep two medium-sized Goldfish.

We change ¼ of the water every week (we have no filter) but still have trouble maintaining things in good order. Is it safe to re-use the water we remove once we've allowed the sediment to settle out? What would you advise?

First, let me point out that your tank is too small; small volumes of water are very difficult to maintain properly, even for an experienced fishkeeper. The fact is that fish cannot remain in good health if the environment in which they are living is in any way polluted.

Water quality is one of the most, if not the most, important factor in fish health and therefore only doing the amount of weekly maintenance you describe in your letter would not be enough in the size of tank which you have.

I would never recommend a beginner to try to keep fish in a tank less than 24 × 12 × 12 inches, but preferably 36 × 12 × 15 inches, for this size of tank would prove easier to maintain.

In a tank the size of yours, I would do small partial water changes on a daily basis: about ¼ of the total volume. Make sure that the temperature of the new water is approximately the same as that removed.

Do not use the same water which you have taken out, as this would be quite a pointless and dangerous exercise. Although the water might look clean, it will contain ammonia from waste products from the fish. A build-up of ammonia within the aquarium will cause major problems for your fish so, as you see, they do need the change of water.

HERPETOLOGY

Tegu Tips

Can you provide information about the different species of large lizard known as Tegus? Are they suitable to maintain in captivity?

The family Teiidae contains about 225 different species mainly found in Central and South America, although some species occur in North America. Teiids include lizards called Ameivas, Racerunners, Tegus and Whiptails.

Two species of *Tupinambis* are currently recognised:

1 The Great or Black Tegu (*T. teguixin*) is found in South America from Guiana southwards to Uruguay. This heavily built lizard can grow to almost a metre in length. The cylindrical tail is particularly long, comprising three fifths of this total.

As one of the common names suggests, normal overall body coloration is black (or brown). This basic pigmen-tation is attractively broken up with bars of white, cream or yellow. Due to its extensive geographical range, local variations in coloration can occur.

For example, one variant known as the Golden Tegu or Black-pointed Tegu has, in the past, been classified as a separate species, *T. nigropunctatus*. However, these are now regarded as a localised colour morph of *T. teguixin*.

2 The other recognised species, the Red Tegu (*T. rufescens*) has a less extensive geographical range, mainly occurring in the Chaco region of northern Argentina. This species can grow to a larger size than the Black Tegu.

In common with most other members of the Teiidae family, Tegus are not the most suitable lizards to maintain in captivity. Adults are not easily handled and can deliver a painful bite.

Due to their size, activity and general temperament, Tegus need a very large and strongly constructed vivarium. A background environmental temperature of 25° to 30°C (77° to 86°F) must be maintained day and night by using a thermostatically controlled heat source. During the daytime, a basking hot-spot should also be created by using a silvered spotlight or heat-lamp.

A substrate of dry newspaper is inexpensive and simple to replace, so that the vivarium can be kept clean and hygienic. Tegus have a large appetite and produce a lot of faecal waste. Other essential items of vivarium furniture include a log on which the reptiles can bask and a large water bowl. The water should be changed frequently.

Tegus continuously use their deeply-cleft long red tongue to 'test' the air. In the wild they hunt for worms, insects and small reptiles. Large specimens feed on small rodents and other mammals. Sometimes, they also feed on birds' eggs and fledglings. Their diet can include a small amount of plant material such as fruit. Tegus are also scavengers. Therefore, they will feed on dead mice and chicks, chopped meat and canned dog or cat food.

These spectacular reptiles not only bite humans, but they are also aggressive towards members of their own species. Serious fights can develop between inhabitants of the same vivarium. Thus, a Tegu needs to be maintained on its own for much of the year.

During the summer, breeding activity can sometimes be promoted by putting a true pair together in a large vivarium. Adult males can be identified because they have femoral pores and broader heads than with females.

After mating has occurred, the reptiles must be returned to separate vivaria.

In the wild, females have been recorded as laying their eggs in termite mounds. In captivity, a deep tray of fine sandy soil must be provided as an alternative.

Tegus (the one being held in this picture is the Golden Tegu) can be handled, but only if you know what you are doing ... and with great care.

KOI

Media management

1 I've seen all kinds of filter materials advocated. Is there an optimum one?

Almost any material can be used as a filter medium, the only essential requirement being that it is inert. The ultimate aim of a filter medium is to encourage the formation of friendly bacteria which will colonise the surface, thus removing harmful toxins.

Therefore, this medium — whatever you choose — should have a rough texture with a lot of nooks and crannies, rather than a smooth slippery texture.

2 How often should filter media be cleaned?

This is purely dependent upon such factors as stocking rate, flow rate, solids removal etc., but a good rule is to monitor water conditions continuously and to institute a cleaning routine when water conditions begin to deteriorate. Cleaning should be carried out using pondwater and should not be too vigorous, so as to limit the loss of existing bacteria.

3 Is there any benefit in injecting extra air into the filter medium?

Absolutely! The very term 'aerobic' means that the bacteria are oxygen-dependent, so the more air that can be added, the better it is for the bacteria.

What is not required is the formation of anaerobic bacteria which can result in filter poisoning.

Necessary safeguards?

Last year, after introducing my first six Koi, I was advised to treat the pond against Fungus, Bacteria, Fin Rot and Mouth Rot purely as a safeguard and to do the same each spring.

Furthermore, if it was my intention to introduce further fish this year, I should put them in first and then add the remedies, so that I treat the old fish as well as the new.

I've never been a believer of the so-called prophylactic treatment of pond and fish. In my own personal opinion, I think that the less chemicals the better. However, perhaps I'm an old stick in the mud?

If you feel it's necessary, then, of course, go ahead. The treatment you have already used should be fine.

Just one word of caution, though: I hope you intend to quarantine your new fish first, at least for a few weeks. It only needs one sick fish to wipe out the lot!

Even if you don't pre-treat your pond, take steps to ensure that you don't spread disease to healthy stock by inadequate quarantine/ acclimatisation.

MARINE

Tubifex worms can be used in marine aquaria, as long as the necessary precautionary steps are followed.

Tubifex and marines

When I kept freshwater fishes, I used to feed them with *Tubifex* worms. Can I use them in my marine tank?

There is no reason at all why you shouldn't use *Tubifex*. In fact, when pressed into crevices in coral heads etc., they can help with the feeding of finicky feeders, like some butterflies.

However, you should be very careful. Tubificid worms will die very quickly and foul the aquarium if not eaten. They will also need to be washed thoroughly before being offered to fish, just as they would be for use in freshwater aquariums.

Also, of course, they should never be used more than once a week.

Emperor 'cauliflowers'

My Emperor Angelfish has developed two whitish blobs on its fins. They look almost like cauliflowers. They don't seem to bother it, though. What are they?

Sounds like Lymphocystis, a viral disease which is common among coral fishes.

Good news and bad surround this malady. It is, to all intents and purposes, incurable. It is, however, very rarely serious. It will only kill when it affects the mouth, thereby interfering with feeding.

If your angel is a big brute, then the best treatment is simply to cut off the tumours with sharp scissors. On smaller creatures, simply wait for the fish's own immune system to take over and eliminate the tumour; this usually takes 3 or 4 weeks.

The Jack MISUNDERSTOOD

Mary Bailey's reluctant introduction to this impressive cichlid led her to the conclusion that it is not the sinner it is often made out to be. She also fell in love with it.
Photographs — unless otherwise stated — by the author

Although I was less than enthusiastic about learning German at school, I have to admit that it has proved immensely useful to me as an aquarist, as so many scientific papers and excellent books on the hobby are available only in that language.

Thus it happened that a short time ago, I was looking for information on *Nandopsis tetracanthus* in one of my German books, and noticed in passing that there was a section on "*Cichlasoma*" *octofasciatum*, the Jack Dempsey, a fish often omitted from recent texts, probably because it is not 'new and exciting'. I decided to pause and read, and quietly chuckled at the phrase used to sum up this fish — "*negativ beurteilt*" (= "regarded negatively")!

That is something of an understatement! The average hobbyist would not touch a Jack Dempsey with the proverbial bargepole, although (s)he might consider dabbling in Lake Malawi Mbuna, or devoting attentions to the infinitely more destructive and antisocial Oscar (*Astronotus ocellatus*). The confirmed 'cichlidiot', on the other hand, has little inclination to keep a species that has been around so long that it must, by definition, be uninteresting.

But when it comes to fact, rather than myth, the Jack Dempsey is: a) relatively peaceful b) extremely beautiful c) very interesting.

I hope I will be able to persuade some of you to find out what you are missing.

JACK DEMPSEY TAXONOMY FACTFILE

Original Description:
Regan, 1903 — as *Heros octofasciatus*
"Section" Transfers:
to *Cichlasoma* (Parapetenia) in 1905
to *Cichlasoma* (Archocentrus) in 1906
to "*Cichlasoma*" (Nandopsis) in 1983
Synonyms:
Cichlasoma hedricki Meek, 1904
Aetamerus octofasciatus (Regan, 1903)
Cichlasoma biocellatum Regan, 1909
Vieja biocellatus (Regan, 1909)
Current Status:
Uncertain. The species has features of both *Nandopsis* and *Archocentrus*, but does not fit properly into either.

M.P. + C. PELNOR

Bad press

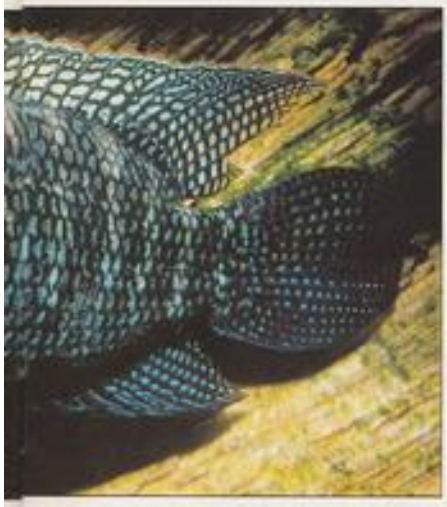
It is hardly surprising that "*C.*" *octofasciatum* received a bad press when it was first introduced to the hobby. The details of its debut are veiled in the mists of time, but it would appear that it was one of the first cichlids to enter the hobby, and was certainly one of the largest, if not the largest, available at the time.

'Primitive' fishkeeping almost always involved an attractive community aquarium, probably using a rather small tank, and it takes very little imagination to picture the impact of a 6in (15cm) territorial, and at least partially piscivorous (fish-eating), fish on a shoal of Neon Tetras in a 24 x 12 x 12in aquarium — or, for that matter, on the entire set-up. It was only a short time before this apparent pugnacity led to comparison with the famous boxer, and the Dempsey was marked down as "nasty" for evermore.

Today, most of us have a greater understanding of cichlid psychology. For example, we realise that what appears to be aggression is, in fact, defensive behaviour, territoriality being an essential adjunct of the brood care that makes substrate-spawning cichlids so interesting to the aquarist.

Head study of my male. Note the lower lip damaged from mouth-fighting.

Jack Dempsey: BEAUTY



Male Jack Dempseys tend to be less heavily barred than females — especially breeding females.

MAINTENANCE FACTFILE

Tank size: At least 30 x 15 x 15in (45 x 38 x 38cm) for a mated pair.
Water chemistry: Neutral to moderately hard and alkaline.
Temperature: 76-80°F (c24-27°C)
Filtration: Any type, but avoid strong currents.
Substrate: Small to medium grain gravel.
Tank decor: Rocks, bogwood, flowerpots. Plants should be potted or 'collared' with stones.
Diet: Raw fish, earthworms, whiteworms, prawns/shrimps, mussels, woodlice, pellets (in small quantities).

We appreciate that a species which, in the wild state, holds a territory the size of a small room is liable to take exception to being asked to share a 36in or 48in tank with other similarly territorial cichlids. And that if small fishes form part of the natural diet, then the aquarist rather than the fish, is to blame if small tankmates are regarded as elevenses. But such is human nature that we happily and successfully apply these data to real nasties like *Nandopsis managuense* while still stubbornly type-casting the Dempsey as a villain.

In fact, the Dempsey can be (and often is) successfully kept as a member of a community of the smaller Central American cichlids. Fireworks are nonetheless likely if more than one male is present, when pair formation is in progress, and, of course, if breeding takes place — but only during the last of these, are heterospecific tankmates likely to suffer any intentional damage. If the tank is large enough, then they will probably be able to keep well away, or the aquarist can insert a divider.

However, as with almost any substrate spawner larger than dwarf species, the most sensible approach is to give a pair the privacy of a tank of their own; a 36 x 15 x 15in is fine, but, at a pinch, a well-mated pair will be happy enough in a 24in tank.

Chequered history

The taxonomy of *"C." octofasciatum* is rather interesting. As long ago as the beginning of this century, ichthyologists realised that the fishes grouped together in the genus *Cichlasoma* probably belonged to several different lineages.

In 1905 the English taxonomist Charles Tate Regan undertook a revision of the genus, and attempted to clarify the situation by splitting the genus into 'Sections', each of which contained rather closely related species probably having a common ancestry.

Several species, however, failed to cooperate with this system, and one of these was *octofasciatum*. Its morphometric characters (counts of fin rays and scales, together with body proportions) point towards membership of the Parapetenia section (which included *managuense*, *salvini*, and *dovii*), but its mouth shape and colour pattern were far more reminiscent of Archocentrus (which included *nigrofasciatum* (the Convict), *spilurum* and *sajica*). Regan assigned the species to Parapetenia in 1905, but a year or so later, changed his mind and placed it in Archocentrus instead.

A further problem lies in the distribution of the species. Its natural range encompasses parts of Belize and Mexico, but *Archocentrus* is otherwise unknown from Mexico, having a much more southerly range. And there is an even greater puzzle if we consider *C. biocellatum*, a species now regarded as a synonym of *octofasciatum*.

This fish was described by Regan in 1909, and supposedly originated from the Rio Negro near Manaus. The Rio Negro is a tributary of the Amazonas in South America, and a long, long way from Mexico! Moreover, the area around Manaus has been extensively fished in recent years and no-one has found anything remotely like a Jack Dempsey there. We will probably never know the answer to that particular little mystery.

More recently, *"C." octofasciatum* has again been considered a Parapetenia (and, to confuse matters even further, Parapetenia is now a junior synonym of *Nandopsis*), but I suspect that it may not be quite that simple! Not all organisms allow themselves to be neatly pigeonholed by scientists. For one thing, I cannot equate the behavioural characteristics of the Dempsey with those of *Nandopsis*, and perhaps, as behaviour becomes more generally accepted as a valid character, the species will be re-assigned yet again.

For this reason, I have continued to use *"Cichlasoma"* for the generic placement of the species, despite the recent decision to utilise old generic names and Regan's section names for Central American cichlasomines (see **Spotlight on the Convict Cichlid** *A&P* March 1994).

Natural habitat

In nature, the Dempsey is found in streams with a slight to moderate current, often in not particularly clean or well-oxygenated water. Hardness varies from slight to moderate, and pH is generally alkaline. Temperatures may rise to rather high levels on occasion.

Clearly, we have here a fairly hardy species, but that is not to say that we should not provide healthy water and and a sensible environment in captivity. I can state from personal experiences that this hardy fish will turn upside-down in seconds if subjected to a low pH, having tried (in an emergency) to house one in an Uaru tank with a pH of about 5. Mercifully, it recovered equally quickly when returned to neutral conditions.

I have to add that this is the only time in 20 years of fishkeeping that I have seen a fish react immediately to a change of pH. I still feel guilty about it!

Unusual behaviour

To my eternal shame, I myself, for many years, regarded the species as being of no particular account. Then a fellow British Cichlid Association member reported getting up in the middle of the night for reasons unconnected with fishkeeping and chancing to notice his Dempsey lying in a cocoon of mucus.

Neither he nor I had any idea of the significance of this behaviour, but Dr Ethelwynn Trewavas commented that it was extremely interesting, as such behaviour had been observed frequently in marine Parrotfishes, where it apparently acts as a defence against nocturnal predation by other fishes. Parrotfishes are thought to be fairly closely related to cichlids, so this might be a significant parallel.

I therefore decided to obtain a Dempsey and see if it would exhibit the same behaviour, with a view to taking some photographs and making detailed observations.

It was at this point that I discovered that obtaining this species, and especially

obtaining a decent specimen, is not easy. A tour of Devon turned up a few colourless, often clearly unhealthy, specimens, but nothing I was prepared to give tank-room to.

Then a local shop took in a breeding pair whose owner was tired of producing fry which he could not sell. I, likewise, did not want this problem, and had no particular desire to observe 'normal' Dempsey behaviour — but when it came to it, the pair were so obviously well-mated that it seemed unfair to split them, so home they both came.

I proceeded to go over to a semi-nocturnal existence over the next few weeks, crawling out of bed and 3am, staggering out to the fish-house with a torch, and never seeing a trace of mucus. In retrospect, as my fish-house has no windows, it might have been easier if I had simply reset the time-switch on the lights so that fish-house night coincided with my day! But that is by-the-by.

Retiring nature

Although the fishes failed to do what I had bought them for, I did not now regret my purchase, as they had settled in well and were showing excellent colour. Many of the body scales have an iridescent blue-green spot, and if the fish is unsettled, this colour tends to be displayed against a whitish background, giving a washed-out effect. This is what we usually see in the shops.

In more confident individuals, the background becomes medium to slate-grey, and the blue-green combines with a dark, often broken, longitudinal band, and the equally dark eight vertical stripes ("*octofasciatum*" means 8-banded) and interorbital barring, to produce a most striking appearance. A territorial male usually loses this barring and has the blue-green enhanced, so that the appearance is of a largely metallic blue-green fish.

My pair had originally been installed alone in a 48 x 15 x 15in tank, but constraints of space had meant that a divider had been used to restrict them to approximately ⅓ of this area, with the remainder occupied by five young "*Cichlasoma*" *panamense* (another species whose taxonomic position is uncertain) which I was growing on, and which measured variously 1.5 to 2.25in SL. (SL = standard length (ie) the length from the snout to the base of the tail).

The Dempsey section was equipped with several rock caves, created mainly by leaning pieces of slate and granite against the end and rear glasses. A flat stone had been positioned at the front, as a dining area, rather than a spawning site. A certain amount of excavation had taken place from the caves.

I now noticed the appearance of a pit next to the 'dining table', and then realised that the latter was covered in eggs. The female was lurking in her cave, looking most apprehensive. The male was nowhere to be seen. Well, I tell a lie; I could see a bit of his tail protruding from behind a slate. Where, I wondered, was the aggressive species I had heard about?

Photographic challenge

I soon realised that the female was coming out and fanning the eggs when I was at the other end of the fish-house. I desperately wanted to take some photos of this, so I set up the camera on a tripod and retired to a distance to see what would happen.

She was not amused, but a sense of parental duty had her back in position after about 20 minutes, so I went away to let her settle to the idea. This she did, but she simply would not tolerate my presence at the viewfinder.

More in hope than in expectation I focussed on the eggs, adjusted camera

My female with a batch of eggs.

position so that the shot would include the area above them, and retired to the other end of the fish-house clutching a very long cable release. This turned out to be one of those days when I wondered why I was so hungry and then realised I had lost track of time and missed lunch — but the trick worked.

Mindful of the unsaleability of Dempsey fry, I did not bother with hatching brine shrimp, but left them to their own devices. They, in fact, picked away happily at particles from their parents' food — beef heart, raw fish, mussels, prawns, earthworms, pellets, etc — and appeared to be thriving. This state of affairs was, however, sharply curtailed about 10 days after they became free-swimming (and about 18 days after I first noticed the eggs) when the parents decided they were ready to spawn again, and 'recycled the protein' to make way for the next batch ... i.e. they ate their young!

This pattern of behaviour was repeated for several months. An interesting diversion was a rather unusual piece of wickedness by the *panamense* next door. The divider was not entirely fry-proof, and a few of each brood had slipped through and been duly eaten. Imagine my astonishment at finding one of the *panamense* making parental-type signals (fin-flicking) to the Dempsey fry, and then eating them when they responded by squeezing past the divider to the surrogate parent!

Peaceful separation

I lost count of the number of spawnings — every one producing fry — but, eventually, the pattern was broken and the expected next batch of eggs failed to appear. There was no sign of aggression between the adults, but I was aware of the danger of a sudden and probably bloody divorce once the breeding season was over.

Although some aquarists are under the impression that some substrate-spawning cichlids mate for life, this is, in fact, rarely the case, and the normal pattern of behaviour is for a pair to breed together for a single season, and then separate. It is possible that they might meet and mate again the following year, but equally probable that other partners would be chosen.

One must also bear in mind that the life of a 5-6in wild fish is a fairly hazardous one, with a high likelihood that one or other of the partners would fall victim to accident or predation.

Non-shoaling species such as the Dempsey can resent the presence of conspecifics (members of their own species) outside the breeding season; males may remain territorial and extremely hostile to intruders. This is the reason why so often aquarists report that an apparently settled pair of "*Cichlasoma*" suddenly falls out and the male kills the female. In the wild, she would simply swim away, but she does not have this option in the aquarium.

Being aware of this danger, I immediately separated the pair into individual tanks. In the event, the female died a couple of months later, but the male continued to grace my tanks for several years, and became quite a pet.

When I decided to buy my Dempseys, it was with a view to research, rather than fun — which just goes to show how things do not always (with cichlids "often" is a better word) turn out as expected.

I had just as much, if not more, pleasure from my Dempseys, as from many of the far more exotic species I have kept over the years, and they remain high on my list of really worthwhile cichlids.

AP

FURTHER READING

There is a **British Cichlid Association Information Pamphlet** on "*C.*" *octofasciatum*, price 50p (PO or cheque) from **BCA (AP), 7 Delamere Avenue, Sale, Cheshire.**

COLDWATER JOTTINGS

BY STEPHEN J. SMITH

Catfish catch

I was delighted to hear from Simon Clarke of the Catfish Conservation Group in response to an item in January's Coldwater Jottings about a monster catfish catch.

Simon explains that English Nature are obliged to approve all Wels Catfish stockings and that they will not oppose any such application as, they say, Wels Catfish present no threat to ecological balance in lakes. He explains that catfish stockings are widespread and that MAFF and the NRA will approve all stockings in still waters, provided that they meet certain criteria (such as proximity to rivers).

"The Wels Catfish has been established in the UK for over 100 years," explains Simon. "They are an introduced species, along with many other species, including Common Carp." He continues, "All stockings have a health certification as a pre-requisite and, as such, catfish stockings are more strictly controlled than other species, reducing the risk of problems which may occur with these other species." According to Simon, there have been no reports of any waters being detrimentally affected by catfish.

Simon was pleased to advise about the suitability of Wels Catfish for the aquarium. "Due to the prodigious growth rate when young, Wels soon outgrow their aquarium, in common with many other catfish, coldwater and tropical."

The Catfish Conservation Group would be pleased to provide information about Wels Catfish as a species, and their care in aquaria and ponds. For information, contact **Simon Clarke, Catfish Conservation Group, The Retreat, Heath Lane, Ewshot, Surrey GU10 5AW. Tel: 0252 859604.**

Oh, and by the way ... Simon points out that we misspelt the Latin name of Wels Catfish. Of course, it should have read *Silurus glanis*, of the family Siluridae.

Did You Know ...?

... that aspirin is believed to be poisonous to fish? And that the leaves of willow trees contain aspirin?

So, what is one of the most popular trees to be seen alongside ponds? Yes, the willow!

If you are planning to build a pond under your willow tree, or even to plant a willow tree next to your pond, then please think again. The falling leaves are likely to leech aspirin into the water, and could cause fish fatalities.

Well, at least they won't get a headache!

SOAPBOX

JOHN EDWARDS

Healthy looking young Koi... but is it really healthy? Adequate acclimatisation will help you decide.

Getting the best from your retailer

Thinking of buying some extra fish for your collection for the new season? Or even thinking of setting up an aquarium? If so, take care, and take heed.

It is all too tempting to add that beautiful specimen you see in the petshop or garden centre to your collection; but don't forget quarantine. The correct word, really, is *acclimatise*, and acclimatisation is your first, most important part of dealing with new fish.

Make sure that you have an oxygenated tank separate from your main aquarium in which you can temporarily keep your new fish without the risk of introducing disease to your existing collection. Every year I encounter dozens of disappointed aquarists throughout my travels, who have lost fish simply because they did not allow a quarantine or acclimatisation period.

Usually, two or three weeks will provide enough time to ensure that your new acquisition does not develop a disease, often White Spot or Fungus, usually brought on by nothing more than stress. The effort of quarantine is well worthwhile when you consider that not to do so, places all of your existing collection at risk. I have even heard of people quarantining their fish for 'one year and one month', and even then, they are never quite sure, though I would not have thought that such a long period is really necessary.

Turning to how many fish you should introduce: yes, you could go down the road now and buy two dozen or more fish to put into your new aquarium or pond — but will they still be alive and kicking next month ...?

Treasure the advice of those retailers who will allow you to obtain only a few fish this month, then a few more next month; they are doing you a favour. After all, if you value and follow their advice, you will glean far more satisfaction from the hobby, and they will have gained a loyal customer.

Brian's pond success

Brian Singleton, whose method of using an air pump to allay winter freezing was featured in last month's **Jottings,** has responded to my piece with a further letter and some photographs of his pond. Brian explains that the disturbance on the water surface is created by the 'Pixie' air pump described in last month's item.

"The fish appear to enjoy the water disturbance, particularly on hot days," remarks Brian. "Although the movement looks a lot, it is not sufficient to harm the lilies. There is also a small waterfall on the left of the pond which runs down over the rockery.

"This water is moved over the waterfall by means of a different pump and, before it re-enters the pond, it flows through a self-built filter system using stone chippings and Lytag clay balls. Added to this, I have planted marginals in the filter, and this set-up has worked very well."

Thank you, Brian, for your information and photographs, which show a very impressive set-up. Perhaps readers will let me know of their own pond set-up, with photographs if possible, for future issues of **Coldwater Jottings.**

Brian Singleton's 'aerated' pond.

BRIAN SINGLETON

Chasing Rainbows

West Cornwall fishkeeper, **Ray Hocking,** 'goes native' as he flies out to Australia to check up on the status of some of its Rainbowfishes. ***Photographs by the author***

A look in most British aquarium shops will show a poor selection of Australian Rainbowfishes. There are more New Guinea species, that's true, but the Australian Rainbows, as a group, are sadly lacking.

I was curious about this and about what Rainbows one could find in Queensland. I also wanted to know if local aquarists kept these species. Therefore, there was only one thing for it. I had to go and check, didn't I?

What I found was very interesting. Some species, for example, have a restricted range. The Lake Eachem Rainbow, *Melanotaenia eachamensis* was such a case, its habitat being Lake Eachem. Then there was *Cairnsichthys rhombosomoides*, found only in creeks that run off the Bellenden Ker Range near Cairns, the Honey Blue-eye, *Pseudomugil mellis*, which is restricted to some creeks in south-east Queensland ... and there were more!

Fish with such a limited range could easily become endangered, so I needed to find an Australian fishkeeper or, better still, a Rainbow enthusiast. But Brian, my Australian brother-in-law, didn't keep fish, nor did he know of anyone who did. I was therefore going to have to find one when I got there.

Thriving group

Reflecting on my Australian trip, the locating of an Australian native fish enthusiast was unbelievably easy. I just used the Yellow Pages. Listed under Aquarium Shops, I found Queensland Federation of Aquarist Societies, a confederation of 10 Clubs which include a Cichlid Group, Marine Group, a Reptile Keepers Association AND an A.N.G.F.A. Group.

Right. One of the Gudgeon or Sleeper Goby species kept by Australian hobbyists is *Hyseleotris compressa*, the Empire Fish or Carp Gudgeon.

Below, an enlarged shot of Neil Armstrong's original picture of Ornate Rainbows from Teewah Creek.

A male Ornate Rainbow from Carlan's Creek. Note its bold red body and caudal fin coloration (see Red-finned Blue-eye caption — same factors apply here).

Its president, Phil Casey, who I was to meet several times, was able to put me in contact with Dr. Bruce Hansen, a native fish specialist and founder member of the Australian and New Guinea Fishes Association, ANGFA for short. Formed in 1982, ANGFA now boasts branches in Germany, Scandinavia and the United States among other countries, as well as members in Russia!

Its quarterly magazine, *Fishes of Sahul*, is of high quality and most professional, while its *ANGFA Bulletin* is helpful in obtaining or selling captive-bred native fish.

Threatened Rainbows

Despite laws in all Australian States regarding the removal of wild fish, some species still face serious threats to their existence. Housing and industrial developments, together with foreign introductions, such as *Gambusia*, *Poecilia* and '*Tilapia*' species, have taken their toll.

Within the 'ponds' in Bruce's garden is one such species with a limited range and under some threat. The most beautiful fish I have seen, this red form of the Ornate Rainbowfish, *Rhadinocentrus ornatus*, is stunning. Found in the Tin Can Bay/Fraser Island populations, individuals showing this recessive red gene vary; some may show only a red tail, while in others, a large proportion of the body is red.

Affectionately called 'The Rhad' by ANGFA members, it's a fish of the sandy, coastal areas of Southern Queensland and northern New South Wales. It prefers soft (50ppm) and acid (5-6.8) water between 15 to 25°C (59-77°F) and, normally, tannin-stained.

Bruce has kept the species for some time and experience thus gained shows a lifespan of around 3-4 years. It is also fairly easy to breed but quite sensitive to chlorine and copper. They would do well, I'm sure, in the soft water of West Cornwall, my home, if only I could get some.

There are export controls *on all* Australian animals and plants, and the penalties are severe, so all I brought home were photographs and memories. Within some of Queensland's 40 National Parks some 'Rhad' populations are protected, but so is *Melanotaenia eachamensis*, the Lake Eacham Rainbow, and that's considered extinct in the wild!

A crater lake in the Atherton Tablelands south of Cairns, Lake Eacham was probably the only habitat of *M. eachamensis*. Grunters and 'The Mouth Almighty', *Glossamia aprion*, introduced into the lake decimated the native stock to irrecoverable levels and it was, indeed, fortunate that this species was being kept and bred by ANGFA members, particularly as it is not a colourful fish by any means. From fish supplied to the Queensland Department of Primary Industry, a healthy number were bred, and some 3000 were reintroduced into Lake Eachem in 1989. This attempt has, by all accounts, failed.

The Mosquito Fish (*Gambusia* — almost certainly *G. holbrooki*) presents a very real threat to native species.

Top, Bruce Hansen's various 'ponds' house a range of species, some of which are endangered in the wild. Note the original use some old tyres have been put to!

Above, the new species, the Red-finned Blue-eye, is a tiny but beautiful fish. This shot is an enlarged version of an original taken by Neil Armstrong.

However, existing stocks held both by the Dept. of Primary Industry and ANGFA will ensure this species does not disappear. I consider myself extremely fortunate to have seen some live Lake Eacham Rainbows.

New species

Discovered in November 1990 by an ANGFA member, Peter Unmack, in some artesian springs in western Queensland, the Red-finned Blue-eye, *Scaturiginichthys vermeilipinnis*, is a small fish with a very long name. Since its full size is a mere 25mm (1in) it meant putting on my glasses just to see it!

The habitat of this species is already under threat from Mosquito fish *(Gambusia)* and a conservation order has, consequently, been placed on the whole area. Permits need to be obtained to keep this fish and, I am told, only three of these have been issued, all to ANGFA members.

Dr. Bruce Hansen is one such permit holder and I was able to see the population raised by him in his fishroom. The eggs have a long incubation period of some 5-6 weeks which, in the wild, allow a long time for predation. I doubt very much if we will see this fish in the UK.

Other natives

There are many other native fish kept by ANGFA members. Quite a few such species are community fish, such as the Glass Perchlet, *Ambassis macleayi*, numerous species of Gudgeon, *Hypseleotris* spp, and *Neosilurus* species, the various Tandans — a group of small to medium-sized catfish.

There are also several species of Galaxiids and gobies too, proving that they don't just keep Rainbows in Australia.

A lingering memory ... A pleasant afternoon spent at a creek near my hotel outside Cairns, where I watched Rainbows and tried to photograph Mudskippers, was shattered when, on picking up my room key at reception, I was told that the creek had its own resident crocodile! AAP

If you are interested in contacting ANGFA, write to: The Treasurer, Australia New Guinea Fishes Association, P.O. Box 502, Ringwood, Australia. The subscription fee is $A32.

BACK 1924

STEPHEN SMITH

The front page and a selection of spreads from *"The Amateur Aquarist"* Vol.1. No.1 (May 1924), the forerunner of today's highly-popular and worldwide-acclaimed *A&P*.

There was no way that this month's edition of *A&P* was going to pass me by without a certain amount of fanfare in what is a very special month for everyone associated with the magazine. It was in the same month, seventy years ago, that our favourite aquatic publication was born, as *The Amateur Aquarist*, to serve aquarists throughout the UK and, over recent years as far afield as Singapore, Australia, and the USA.

True to ideals

The magazine has seen some dramatic and continuous changes and improvements throughout its three-score and ten, but has remained true to the expressed ideals of its first editor, **A.E. Hodge FZS,** in his first editorial, May 1924: *"The aims of the magazine are to encourage the novice as well as (to) interest the experienced student of aquatic life, without delving too deeply into the technicalities, and it will be my endeavour, therefore, to give prominence to such topics as are of general concern whilst eliminating those which are abstruse. ... It is because I fancy that other aquarists have a similar desire that the magazine has been launched."*

The increasing popularity of *A&P* throughout its history is testimony to the fact that the latter-day publication has maintained its accessibility, and without any compromise when it comes to addressing the 'technicalities' presented to today's aquatic hobby.

First-time selections

Just as this month's issue of *A&P*, 70 years on, covers all areas of the hobby from popular Fancy Goldfish to breeding marines, so No. 1 Vol. 1 incorporates information on every aspect of interest to aquarists, with features entitled **Paradise fish as parents** by **S.G. Whittle** (vice-president of the British Aquarium Society) and **The Birth of a Bitterling** by **W.S. Pitt.** Illustrations in this first issue were divided between line drawings (believed to have been produced by the editor) and halftone photographs.

The first of a three-part series by **E.E. Dennis** looked at breeding trout; while the last page (page *eight*) reported on the proceedings of the British Aquarium Society. Indeed, it was proclaimed that this page of *The Amateur Aquarist "would form the official medium for the society's reports"* — perhaps a forerunner of today's **Society World**.

Other highlights included **Notes for Novices** (compare with the ever-popular

TO THE FUTURE 1994

On the 70th anniversary of *Aquarist and Pondkeeper*, **Stephen Smith** takes a look at the very first issue of the magazine's forerunner, *The Amateur Aquarist*.

Tomorrow's Aquarist) which advised against the use of a glass globe as an aquarium, and **The "Cradle of Life",** by the editor, which looked at marine life, including the sea cucumber among others. (Coincidentally, one of the recent issues — March '94 — also carried an article on sea cucumbers).

The first of the magazine's ever-popular regular monthly columns was **The Cabinet Aquarium,** of which the editor stated: *"Under this title will be given … the life history of some particular creature suited to occupy one or other of the receptacles which, from jars and globes to propagating glasses and small tanks, form, when ranged on shelves, what is known as 'The Cabinet Aquarium'."*

This first such column highlighted the Silver Water Beetle which, apparently, had achieved such popularity as an aquarium pet that the officials of London Zoo had been unable to secure a native specimen!

First advertisers

While editorial integrity has always been the staff of *A&P*'s life, no publication can survive without its major sponsors, the advertisers. The very first advertiser, taking pride of place on the front page, was **Chapman's** of Tottenham Court Road, London. Advertising as the *"Premier livestock emporium of Europe"*, Chapman's boasted, *"any species of British or Foreign Birds, Parrots or Animals…"* in addition to *"…a fine collection of Monkeys, including the following: Marmozet, Squirrel, Capuchin, Woolly and Rhesus; animals as Zebras, various Antelopes, Lions, Tigers, Elephants, etc., …"*

Other advertisers were: **Spratt's,** promoting a *"Fish-rearing biscuit meal"*; **L. Cura & Sons,** who, on the same page, were also promoting a fish food, *"Cura's XL fish food"*, among a range of products for the aquarist; **De Von and Co,** who *"can supply all your requirements of GOLD, FANCY, COARSE, and TEMPERATURE fish"*; while the back page was equally divided between **L. Haig** (cold-water fish), **Watkins and Doncaster** (nature study apparatus and specimens); **Regent Pet Store** (*"anything alive purchased"*); and **The D.A.P. Ltd** (aerators and fountains for aquaria).

To conclude, I return to A.E. Hodges' first editorial of May 1924: *"There is ample evidence, from the sales of fancy fish alone, that there are, now, thousands of keen aquarists throughout the country. With their cordial support and co-operation, 'The Amateur Aquarist' should soon prove an organ of importance in its own sphere."*

The fact that *A&P* is still going as strong after 70 years as it ever was, is living proof that the words of our first-ever editor are as valid today as they were when he first committed them to paper all those years ago. Here's to another successful and fruitful 70 years! A&P

A&P today

FROGS AN

By JULI

New CITES limits

The **EC CITES Committee** has agreed to implement the following restrictions on the importation of reptiles into the European Community:

1 Trade in Pacific Monitors (*Varanus indicus*) from the Solomon Islands has been banned from 28 September 1993.

2 Trade in Ball Pythons (*Python regius*) from Ghana has also been banned with immediate effect. Ball Pythons are the smallest of the African pythons and are boldy patterned reptiles. They seldom grow to more than 90 to 120cm (3-4ft) in length and their popular name comes from their ability to coil up into a tight ball when threatened. This passive defence posture involves the head and neck of the snake being tucked between the coils of the body.

Perhaps due to their striking markings, but more likely due to this characteristic defensive behaviour, Ball Pythons have been much sought after. In the past, most individuals which have been offered for sale have been wild-caught. Ball Pythons which were directly imported from Africa have not always easily adjusted to life in the vivarium, but captive-bred individuals have proved more successful.

Proper care

The Proper Care of... series of books is published by **TFH** and includes titles about invertebrates, fish, mammals and birds. The latest herpetological title to be released is *The Proper Care of Turtles* by John Coborn. ISBN: 0-86622-534-X.

In common with other books in this series, this latest edition comes in a handy size, measuring approximately 13.5cm by 18.5cm (51/4 by 71/4 inches).

These dimensions allow the book to be easily referred to for information about basic turtle biology, accommodation for freshwater and terrestrial species, diet and feeding, hygiene and general care, reproduction and captive breeding. There is also a short bibliography and three-page index of photographs. The book contains a total 256 pages, of which 123 describe selected genera and species, including six marine turtles! Due to CITES regulations, these Chelonia are not usually maintained in captivity.

Currently, there are 22 other titles in *The Proper Care of ...* series. These include *The Proper Care of Reptiles* and *The Proper Care of Amphibians*, both written by John Coborn. Although John's latest edition has been produced for the "specialist turtle enthusiast", much of the basic information about the care of these reptiles has already been printed in other TFH books.

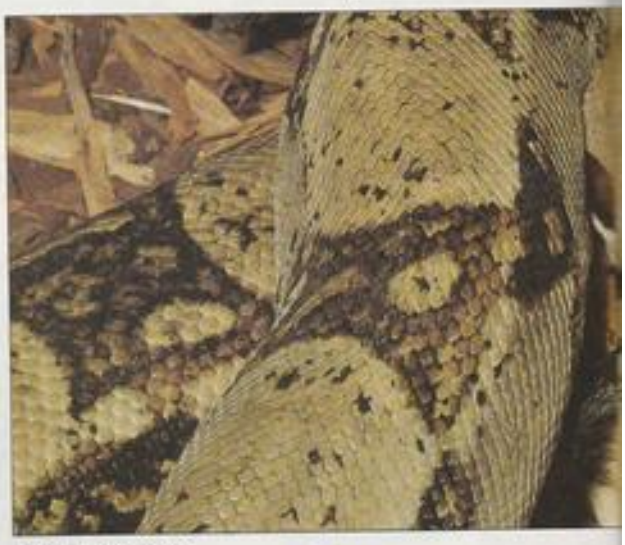
For example, the diagram on page 55 illustrates the use of heat lamps, but the inhabitants of the vivarium are clearly NOT turtles. Many of the photographs

JULIAN SIMS

have also appeared in previous TFH books and guides.

The longest chapter in the book, covering the description of certain genera and species, is quite limited when compared with the excellent TFH publication *Encyclopaedia of Turtles* by Peter C H Pritchard (ISBN: 0-87666-918-6) This book contains very comprehensive information about the terrestrial, freshwater and marine turtles of the world, as well as details of anatomy and biology. It also contains numerous references and an eight-page glossary. Thus, the encyclopaedia is much longer overall, containing 896 pages. It is also much more expensive, costing £42.92.

I am sure that it is this relatively high price which has been a factor in TFH's decision to publish the less expensive book, *The Proper Care of Turtles* is available at the more affordable £9.95 and, at this price, will fill a niche in the market place. However, before buying, have a look at the *Encyclopaedia of Turtles*.



Boa survey

Herpetologists who keep the Common Boa (*Boa constrictor*) — or any of its subspecies — might wish to take part in a survey regarding the captive breeding of these popular snakes. Information is required, **even if your reptiles have not yet reproduced.**

To record your reptiles in the survey, your snake or snakes must be four years of age or older. All information supplied will be kept confidential.

FRIEND

LIAN SIMS

GLYN KOO

The magnificent Common Boa. Help is needed with a captive-bred survey.

In return for requesting and completing a questionnaire, reptile keepers who participate in the survey will receive a chart which shows the subspecies of this snake, with identifying scale counts and geographical ranges. Further details of the Boa survey and the necessary form can be obtained from:

William D Joy
PO Box 821433
DALLAS
Texas 75382-1433
USA

New surveys

This year, the results of past herpetological surveys have been made available in one *Atlas* which shows the distribution of wild amphibians and reptiles in the British Isles. The 1994 *Atlas* has been published by **Her Majesty's Stationary Office** on behalf of the **Biological Records Centre (BRC)** and the **Joint Nature Conservation Committee (JNCC)** who have collated previous records.

Help is now required to collect further information for two new recording schemes — one for Britain's reptiles, and the other for our amphibians. Due to the nationwide circulation of *Aquarist & Pondkeeper*, a contribution from everyone who reads the magazine would be particularly valuable — especially as many readers maintain a pond (or ponds) in which amphibians breed.

The early summer is a good time to record reptiles and amphibians as this year's frog and toad tadpoles are, by then, completing their aquatic development and leaving the water following metamorphosis.

To take part in these important new recording schemes, which will detect any changes in the distribution of the reptiles and amphibians of the British Isles, the necessary recording forms, together with a twelve-page instruction booklet, can be obtained from:

Henry R Arnold
Biological Records Centre
Institute of Terrestrial Ecology
Monks Wood
Abbots Ripton
Huntingdon
Cambs PE17 2LS

JULIAN SIMS

HERP FACT/Sizeable European Salamanders

Large amphibians are not usually thought of as naturally occurring in Europe. Indeed, parts of Asia and South America are home to some of the world's longest amphibians.

For example, in China and Japan, gigantic aquatic salamanders of the genus *Andrias* can grow to a length in excess of 140cm (55 inches), and in northern South America, the Colombian Caecilian (*Caecilia thompsoni*) can reach a length of more than 150cm (59 inches) when fully grown.

But there is quite a surprise living in the ponds, ditches and slow-moving rivers of south-western Europe. Sharp-ribbed Salamanders (*Pleurodeles waltl*), which inhabit Spain and Portugal, can reach the substantial length of 40cm (15¾ inches). These are Europe's largest Urodeles.

More usually, these mainly aquatic and nocturnal amphibians only grow to a total length of 15 to 30cm (approximately 6 to 12 inches). The tail forms at least half of this length and tends to be longer in males.

WHAT'S YOUR OPINION

BY BILLY WHITESIDE

The Sacred Lotus: this species has been grown from seed by WYO? reader Ron King. (see Lily Seeds)

BILLY WHITESIDE

Emergency measures

Candlelight is fine for romantic dinners but not ideal for typing this month's feature. The electricity was cut off ten minutes ago so I assume the day's storm has reached its culmination. The first thing that goes through my head in a power-cut is — tropical fish tanks! I then rush to the telephone to the emergency number and always find that someone else has got on the line before me.

I've just rushed round the six tanks I currently have in use — five upstairs and one down — and pulled the curtains in the rooms. I've also switched on the tank lights — or at least I think I have — so that when the power is restored they will help heat up the tanks again.

Next, I'll consider wrapping a blanket or rug round a tank or two for added insulation. As a last resort I'll get out my Primus camping stove and boil up some water. I'll then bale some of the water out of each tank and float in a plastic lemonade bottle filled with hot, if not boiling, water. When the bottle cools, it's easy to empty it and fill it with hot water again.

What I won't do is what I did many years ago when about ten years old. I won't get a stubby night-light candle, light it and place it a couple of inches beneath the base glass of an aquarium! The aquarium glass simply cracked and thus, I had a whole set of new problems, as well as a cooling tank.

That tank had an aluminium frame and I think I solved the broken base-glass problem by getting a piece of glass cut to fit neatly on top of the broken piece, and simply sticking it in place with silicone sealant. Perhaps I've guessed my age wrongly when the incident occurred. I don't think such sealants had been invented in the 1950s!

How do, or would, you deal with your tropical aquaria in a power cut?

Lily seeds

I took up the kind offer of **Ron King,** of Kingsteignton, Newtownabbot, Devon, and accepted some tropical water lily seeds from his own plants. In an accompanying letter Ron wrote: "The seeds are mixed — (1) Capensis x Director Moore, (2) Capensis x Pink Platter, and (3) Plants from(1) x Panama Pacific.

"The plant from (1) is in flower today (2nd January 1994) in water at 50°F (10°C) and has had no artificial heat in the tank at any time. I have grown *Nelumbo nucifera* (Sacred Lotus) from seed but find it does not winter all that well (see photograph 1).

"I hope the seeds grow for you and that you can grow them on. It will be interesting to see what comes out. I have around 100 bulbs of x (1) which should flower this year. If by chance you are ever over this way, you are most welcome to call and see my set-up. It's best in June to September."

Thank you for the seeds and the kind invitation, Ron. I hope to retire from teaching this year and possibly try to develop a career of some sort that will allow me more time to write, photograph, use a video-camera and work with a computer — and, of course, have more time to develop my interests in plants and animals, with emphasis on fish in particular. ***Drop me a line if you have any suggestions — that are not too rude!***

I'd certainly enjoy a visit to Ron King's set-up.

ID required

Can you identify the fish in the second photograph? Is it a female Red Shiner, or perhaps a Bitterling? I bought the fish as one in a trio sold as Rainbow Dace. My two male Red Shiners show little or no interest in the silver fish, so I wondered if it was a Bitterling.

A glance into my coldwater aquarium at the possible Bitterling made me go for my spectacles. On the last few viewings, the fish has appeared to have a dark, 1/2in. of excreta trailing from its vent. A closer look, confirmed by a good look at my photograph, now suggests that the item in question is the ovipositor of a Bitterling.

Can anyone confirm that the fish is, indeed, a female Bitterling, Rhodeus sericeus, complete with ovipositor?

I don't think I've ever (before?) seen a Bitterling, never mind kept one, so I know only what I've read and seen in books.

Sad acquisitions

Several weeks ago an elderly neighbour died and his son, whom I featured in **Meet the Aquarist** quite some years ago, kindly gave me his father's Lyretail Guppies and several beautiful, large plants of Giant Vallisneria.

I was quite taken aback when I planted the Giant Vallisneria plants in my 30in. aquarium. They simply transformed the scene into one of those rare photographs one sees of a

My female Bitterling ... or is it a Red Shiner?

BILLY WHITESIDE

BILLY WHELDON

The Giant Vallis give my tank a very special character.

stunningly-planted aquarium. I hope my photograph of this tank, taken on Kodak's new and very expensive professional slide film, Panther 100, gives you an idea of just how much the long-leaved Vallisneria enhanced the aquarium.

The leaves, ascending from gravel to surface and spreading around and across it, seem to give the aquatic scene a sense of unity and style, blending top, middle and bottom zones into a beautiful tableau. Splash out on a couple of large, Giant Vallisneria if you have a fairly roomy aquarium and like plants. My photograph shows why I like aquatic plants just as much as I like fish.

Algal response

Some issues back, I asked about experiences with algae. I was pleased to receive a reply from my friend **Dr Neville Carrington,** of Interpet Ltd., Dorking, Surrey, a regular contributor to **WYO?**

Neville writes: "Your question about algae is one which we are most often asked. The problems with algae seem to fall into five categories:

(1) the soft green or brown algae which grow on glass;

(2) the hard algae growing on glass;

(3) hair algae or blanketweed;

(4) hard, hair algae, often black, growing on live and plastic plants;

(5) green water.

"The soft, green algae on the glass perform a valuable function often in reducing excessive light from south-facing windows. There are several species of fish which are very good at removing this type of alga and enjoy it as part of their diet. Both the soft green and soft brown algae which occur in less-well-lit conditions can also be removed by using suitable snails, as well as manually.

"There is more of a problem with the hard algae which grow on the glass, and I have found no way of removing such except using a scraper, preferably a razor blade. We have found ways of countering blanketweed in using one of our products, which is completely harmless, but we have not yet finished our work on transferring this technology to aquariums.

"The hard, short-haired algae growing on plants present a very difficult problem. I have had reports that you can counter this in the short-term using Algizin, and possibly the best way of countering it is first of all to treat with this product, subsequently introducing snails to keep down the future growth and to watch the nutrient content of the water.

"Green water is usually a sign of excessive light and is probably best controlled by manipulating the light level. The problem is caused by minute, free-swimming, green organisms in the water and you can get them to clump together and filter them out using a flocculant.

Power cut aftermath

I'm continuing this the morning after the power cut in the gale. The power was restored last night in my area, after just three hours, and checks on water temperature in my tanks showed a drop of only 3-4°F.

"No problem," I thought — until I looked into one aquarium this morning and discovered that my five large Angels, which I've had since they were about the size of a 10p coin, were in a bad way. Two were dead, two dying and one looking the worse for wear.

The two dying fish are floating on the gravel, nose down in one case, and belly up in the other. One has made it to the surface for air but both look in a bad way. Other fish in the tanks seem perfectly healthy and happy.

A change of about 30% of the water does not appear to have improved matters for the Angels. I don't see a connection between the power-cut and the Angels' deaths.

ANY SUGGESTIONS?

GROWING TIPS

BY BARRY R JAMES

Photographs by the author

Fine-leaved oxygenators

It is a characteristic of many submerged (oxygenating) aquatic plants to produce very finely divided leaves. Often, these are only the thickness of a hair.

This adaptation to a submerged existence reduces the area of contact with the water, thereby reducing the risk of damage by vigorous currents. The stems have no rigidity, enabling them to bend with the flow. The root systems of such plants can often be quite extensive, as they need firm anchorage to prevent them being uprooted and swept downstream.

Others, however, have weak root systems or, in the case of the Hornwort (*Ceratophyllum*), no roots at all. These species are adapted to life in still-water ecosystems, such as ponds and lakes.

These plants inhibit open water with little or no shading from overhanging trees. However, shade is provided in still-water species by the floating leaves of other groups of plants. In fast-flowing water, the turbulence stops excessive irradiation.

In the aquarium, fine-leaved plants are subject to algae infestation and the accumulation of fine debris. This can result in the clogging of the pores where gaseous exchange takes place and the consequent death or mutilation of the plants.

Consequently, every effort must be made to remove fine debris by efficient filtering. Algae, too, must be kept under control.

Many fine-leaved plants absorb nutrients directly into the leaves, rather than via the roots, as in most other plants.

Taking cuttings

Although these plants do produce seed in their natural state, they seldom do this in cultivation. Propagation is therefore by cuttings which root easily in most species.

The stems selected should be about 6-8 in (15-20 cm) in length. The lower three sets of leaves should be removed and bunches of 4-5 stems should be lead weighted and pushed gently into the gravel. Rooting will occur in a few days. It will be necessary to do this every few months to prevent the plants getting 'leggy'.

Fertilisation is essential, but only trace element solutions should be used. Basic fertilisers containing nitrogen and phosphorus should be avoided, as these will encourage algae.

Lighting should be moderately bright, but muted, with some floating plants; Crystalwort (*Riccia fluitans*) is ideal if you can obtain this difficult-to-find species.

Popular fine-leaved plants

1 Cabombas

The **Green Cabomba (*Cabomba aquatica*)** is the biggest selling aquatic plant in the world. Capable of growing to over 2 feet (above 60 cm) in length, it is difficult to establish. The stems should be allowed to float on the surface of the aquarium for a few weeks until roots start to form. At this time, it can be planted.

Two other Cabombas are freely available. The **Red Cabomba (*Cabomba piahyensis*)** has beautiful violet and yellow-coloured flowers. Needs at least 12 hours light per day.

The **Yellow Cabomba (*Cabomba aquatica*)**, like the last-named species, produces small round floating leaves. The flowers, as its name suggests, are yellow.

2 Milfoils

The **American Milfoil (*Myriophyllum elatinoides*)** is a splendid plant with finely divided bright green whorls of leaves. Extremely hardy, it will grow in sub-tropical, as well as tropical, temperatures.

The **Matto Grosso Milfoil (*Myriophyllum mattogrossense*)** is a beautiful species with huge whorls of brown to dark-red leaves. However, only those aquarists with metal-halide lamps should attempt to grow this plant, as it will fail under weaker illumination.

The **Red Florida Milfoil (*Myriophyllum hippuroides*)** has enormous whorls of bright-green foliage. It requires slightly acid water, moderate lighting, and a rich laterite substrate.

3 Ambulias

The Ambulias are popular plants, of which the easiest to grow is the **Dwarf Ambulia (*Limnophila sessiflora*)**.

4 Hornworts

The **Hornworts (*Ceratophyllum*)** are non-rooting plants which float just below the surface. There are two cosmopolitan species which do equally well in aquaria or pool. It is usual to bunch them with a lead strip, and then plant them in the gravel. They will quickly ascend to the surface.

Top right, the slender stems and leaves of the Green Cabomba.

Centre right, the Matto Grosso Milfoil has attractive brown/red whorls.

Bottom right, *Limnophila sessiflora* — the so-called Dwarf Ambulia.

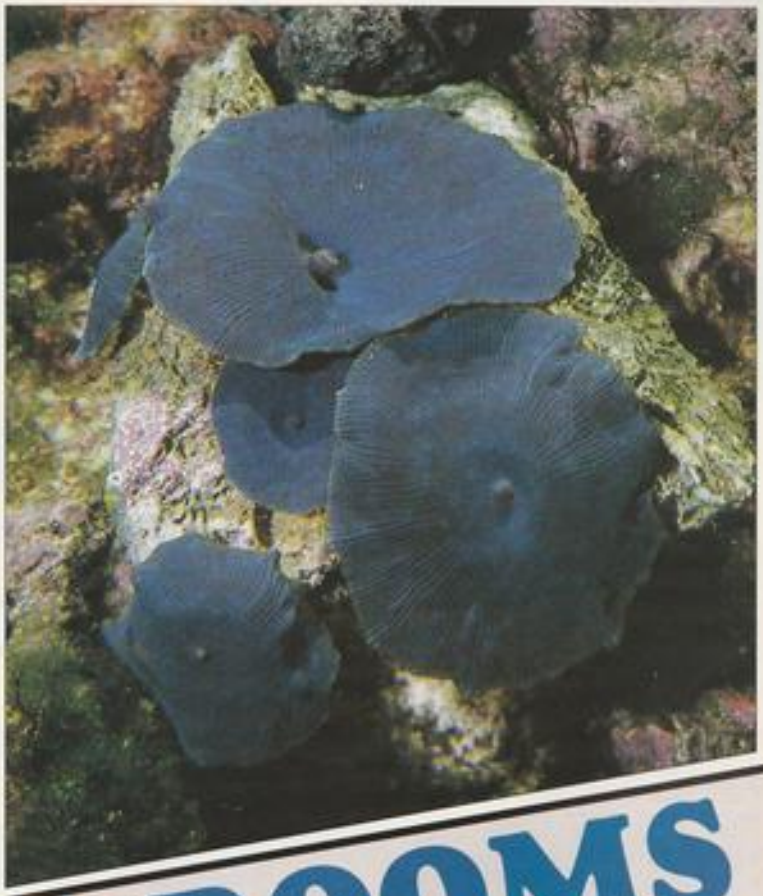
MUSHROOMS
The Missing Link

Nick Dakin introduces a group of marine invertebrates which is not only colourful, but also easy to keep ... and breed.

Photographs by the author

Perhaps I should explain the slightly wacky nature of the title of this article. Mushroom Colonies are often referred to as false corals because they form a halfway-house, as it were, between anemones and true corals, hence the allusion to the 'missing link'.

Many marine aquarists will know Mushroom Colonies by a variety of alternative common names — Coral Anemones, Disk Anemones, Plate Anemones, Mushroom Polyps, Mushroom Anemones and so on. Whatever you choose to call them, they all belong to the family Actinodiscidae, and nearly all species are to be found in relatively shallow tropical reef locations spread throughout the world. As a rule, they are generally encountered in areas of slack water current as a preference to the more animated areas of the reef.



Feeding in the wild

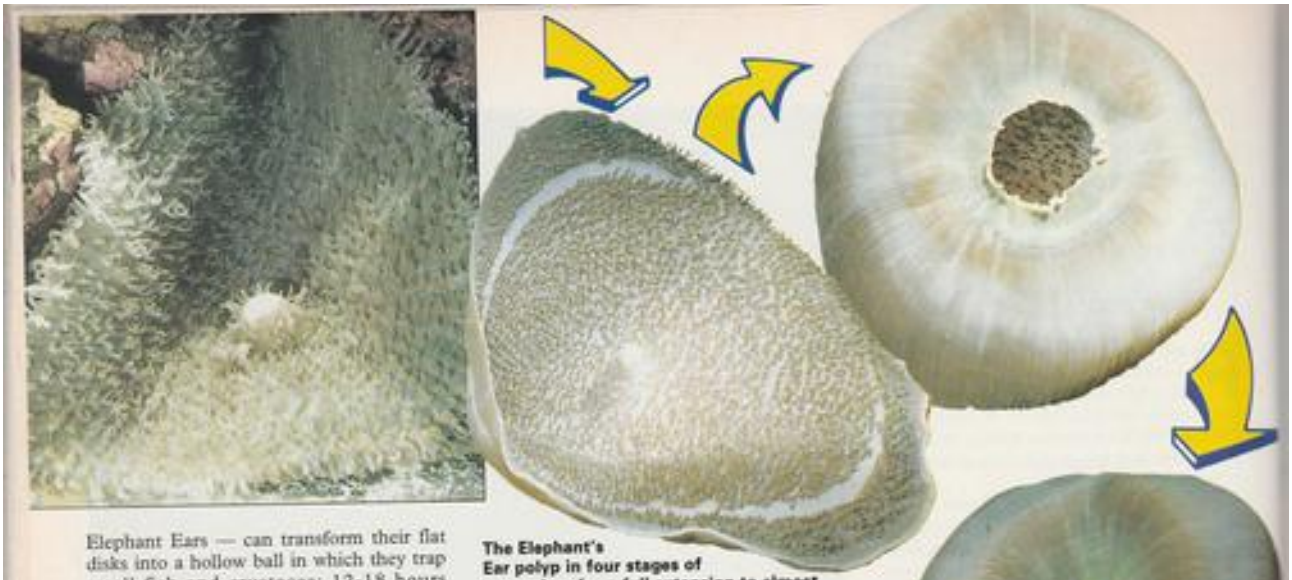
Despite being found at varying depths from just below the water mark down to a murky 40 metres, all species possess symbiotic zooxanthellae algae within their tissues as a reliable and constant source of nourishment.

Even so, mushrooms can gain sustenance via more direct methods. Many species, for example, cover themselves in a mucus layer which traps water-borne nutrients and transports it to a central mouth.

Various other species have a more dramatic approach. *Rhodactis* sp. — the Giant

Top, many species of Mushroom Colonies are, as yet, unnamed beyond the genus level. This beautiful blue species of *Actinodiscus* is just one of numerous such examples.

Right, mushrooms can live happily in most invertebrate aquaria but should be provided with ample space to expand.



The Elephant's Ear polyp in four stages of expansion, from full extension to almost total contraction.

Elephant Ears — can transform their flat disks into a hollow ball in which they trap small fish and crustacea; 12-18 hours later, the hapless victim has been consumed and the disc shape is once more assumed. It is true that not all *Rhodactis* species are able to perform this trick, but the aquarist should be aware that those specimens capable of extending to 12-15in (30-38cm) in diameter must be given some thought before being housed with small fish, shrimps and crabs.

I myself, lost a prized Mandarin Fish to a Giant Elephant Ear, having shared a large tank happily together for over three years! Having said that, there are reports of giant *Rhodactis* sp. being adopted by Clownfish, in the absence of an anemone, and coming to no harm whatsoever, which just goes to prove that there are no 'absolutes' in marine fish keeping. This, unfortunately, leads more often to further confusion, rather than clarification!

Reproduction

In common with many other sessile invertebrates, Mushroom Colonies are capable of reproducing by several methods, in a 'belt and braces' approach. Why some individual colonies should reproduce by one particular method at one particular time is not absolutely clear, but three methods are certainly used frequently.

1 **Division** is an asexual procedure whereby an individual polyp will develop two, or more, separate mouths, finally to divide into several animals. Sometimes, however, these animals will remain fused together, giving the appearance of one animal with several mouths.

2 **Budding off** is another asexual practice commonly found in anemones. The term describes a method by which a mother polyp will bud-off one, or several, small, identical young polyps. These young animals stay under the shade of the mother polyp until they are big enough to move more slowly away to become mature animals in their own right.

3 **Sexual reproduction** is essential to all species wanting to spread their own kind to distant locations. On certain evenings throughout the year, species will release eggs and sperm into the water simultaneously. The fertilised eggs then form part of the planktonic layers of the sea to develop into larvae before descending to a favoured location and building their own colony.

All those practices have been witnessed in the aquarium, with the asexual methods being quite common under optimum water conditions.

Sunburnt Mushrooms?

Yes, it's true, under the intense tropical sun, Mushroom Polyps inhabiting shallow water areas can suffer sunburn! The damage is done by ultra-violet light that has not yet been successfully filtered out by the seawater. In this position, the symbiotic zooxanthellae will produce a yellow, green or turquoise pigmentation in order to reflect and counteract the effects of potentially damaging wavelengths.

Deeper water species are often found to be blue or red, enabling them to gather as much light as possible. These richly coloured species are sought after by the hobbyist and, consequently, command a high price. Maintain their health and deep colours by placing them in a place of subdued lighting; in addition, the actual discs will become much bigger than if situated under brighter conditions.

Self protection

Mushroom Polyps are quite capable of looking after themselves. Not only do they produce a toxin to keep other invading corals at a distance, but they are also very resistant to those toxins produced by other encroaching species.

In the confines of the invertebrate aquarium, such poisons will need to be removed on a continuous basis by the use of activated carbon filtration, which should be fitted as standard equipment anyway.

RECOMMENDED CONDITIONS

Tank: over 20 gallons — 90 litres — nett (not gross).
Temperature: 75-78°F (24-25.5°C)
Ammonia and Nitrite: Zero (not even a trace).
Nitrates: Less than 10 ppm (preferably zero)
Phosphates: Less than 0.5 ppm (preferably zero).
pH: 8.1-8.3
Specific Gravity (SG): 1.022-1.025
Redox Potential: 350-450 mv.
Efficient **protein skimming** and **activated carbon filtration** as standard. Moderate to slow water **circulation**.
Fish stocking level: Absolute maximum of 1 in (2.5 cm) per 6 gallons (27 litres)
Filtration: Trickle filtration is preferable.
Lighting: As described in text and in conjunction with the correct placement of colonies.

Luckily, Mushrooms have very few enemies. As previously mentioned, other stinging corals can pose a threat if territory is restricted by placing species too close together, although Mushrooms of differing species will live in complete harmony, no matter how closely they are situated.

One of the greatest problems is colonies being overrun by nuisance algae. They respond badly to this threat and, often, individual polyps will detach themselves in the search for better conditions.

Very hungry shrimps and crabs will sometimes cause a little damage, as will incompatible fish, but on the whole, if the correct environment is provided, Mushrooms are relatively easy to keep and quite capable of looking after themselves.

WRITE BACK

Elusive 'Giant' Sailfins

I do enjoy the revamped *A&P*... and now there's a new Discus section. Great!

In February's edition, I enjoyed the piece by Tor Kreutzman on the ever-popular Molly. This struck a chord with me because, over the last three months, I have tried in vain to get a couple of pairs of 'giant' Sailfin Mollies (Green). I want decent-sized, good-quality fish that have not been kept in water with salt added.

I have kept tropical fish for 20 of my 32 years and when I was young, kept Sailfins that were huge, did not require salt and spent a good summer in an outside pond. It seems a modern innovation to keep this fish with a touch of salt, possibly because the majority of breeders now add this to their breeding pools.

My fish, when I was younger, were very large indeed and lived a long, healthy life without the additional salt.

Is my search in vain? I hope not. Perhaps some *A&P* readers can help?

Michael Robson,
Wanstead,
London.

[Thank you for your kind comments Michael. I remember the 'giant' Green Sailfins you refer to very well. Some of our readers may do, too. If anyone can help you in your search, we'll be only too pleased to pass on any details or information we receive. **Ed.***]*

HARRY GRIER/FLORIDA TROPICAL FISH FARMS ASSOCIATION

This magnificent Sailfin Molly — from EkkWill Waterlife Resources — is among the largest we have seen in recent years... but it's not green.

Ocean Voice and Cyanide

I have read with interest your article **Cyanide-free San Salvador** in the December *A&P* issue and subsequent articles, since Ocean Voice has been involved with implementing environmentally, socially and economically sustainable alternatives to collecting marine aquarium fishes with cyanide since 1987.

Readers may incorrectly infer from that article and letters that Ocean Voice's programme with the Filipino Haribon Foundation for Conseravation of Natural Resources only trains marine aquarium fish collectors to use nets instead of cyanide. Our holistic programme includes:

- Community organising — involve all the people and government infrastructure
- Publishing educational materials like the *Save our coral reef* manual that deals with education, deforestation, agricultural, dynamiting, pollution and other aspects of coral reef degradation, and the video *Say no to cyanide*, to reach a broad public
- Establishing fish collector co-ops and networks (counters fish buyers who sell cyanide)
- Encouraging establishment of community coral reef management groups
- Encouraging establishment of marine reserves — which help restock nearby reef areas.

Ocean Voice also publishes a quarterly educational bulletin, *Sea Wind*, provides administrative support for the SSC's Coral Reef Fish Specialist Group which is working on a status report on coral reef fishes of the world. Dr. P. Almada-Villela, in UK is carrying out a country by country survey of coral fishes and habitat. Dr. Callum Roberts (of UK), Dr. Frederick W. Schueler (Canada) and myself are conducting a GIS study of coral reef fishes of the world, locating hotspots of species richness for priority conservation, (see, for example, chapter in the forthcoming book, *Mapping the diversity of nature*).

In short, we're doing a bit more than net training!

We also applaud the Mini-Reef Society's planned work. There is an untold amount of work to do and resources are limited. Our policy has been to network, where possible, or carry out our projects alone where not, and not to decry the work of others.

Don E. McAllister, Ph.D.
President,
Ocean Voice International,
Ottawa,
Canada.

Dolphin Reef

Having been professionally involved in captive marine mammal welfare for over two decades, I think I can assist regarding comments on the dolphinarium at Dolphin Reef in Eilat, Israel, as requested in **Seaview** (March '94).

Dolphin Reef is (and, to my knowledge, always has been) a commerical operation, and, as far as I know, the dolphins have *never* been free in the open ocean; they have always been kept in a large sea pen. In fact, to release these animals into sea would be in breach of international guidelines on the reintroduction of flora and fauna by the IUCN (World Conservation Union), due to the animals being alien to the Mediterranean Sea and the detrimental effect they could have on wild dolphin populations and the local ecosystem if released.

As to the allegation in **Seaview** of the Eilat dolphins being 'silent', I cannot comment on the specifics of the dolphins at Dolphin Reef. However, this seems to suggest the promotion of the myth of mutism in dolphins in captivity *per se*. This is something that generally has been scientifically disproved; dolphins in captivity continue to communicate and sonar.

Further, the possible innate healing power of dolphins is something that current scientific research cannot support. There is initial evidence that use of interaction with dolphins as a reward is effective in therapy in autistic and other 'special needs' children. But a computer search I recently commissioned on the published psychological research on this subject, could not find any evidence to suggest that dolphins themselves possess powers of healing.

Finally, as to Gordon Kay's views on captive cetaceans, myself and colleague marine biologist, Peter Bloom, did try to point out the true facts of cetaceans in captivity. (**Letters, August, 1992**). Clearly, he remains unmoved in his views and still considers that keeping dolphins and whales in captivity is wrong — although keeping fish is presumably okay!

John Dineley,
Willingly-to-School,
Animal Training
& Husbandry Consultancy,
Bedford.

Gordon Kay Replies

Mr Dineley states that the dolphins at Dolphin Reef have never been free in the open ocean. This is contrary to all information that I have ever received. I'd always been led to believe that the dolphins were free to come and go as they pleased.

However, I cannot understand Mr Dineley's comments about their release into the wild being in contravention of the IUCN guidelines. Bottlenosed Dolphins are widely distributed in cold, temperate and tropical waters of all seas. In fact, their existence in coastal waters is particularly well documented.

Further, Mr Dineley goes to great lengths to dispel the notion that dolphins in themselves possess healing powers. Why? Who claimed that they do? Certainly not !! As to the silence of the animals at Dolphin Reef, I cannot comment, since I, like Mr Dineley, have not witnessed them for myself.

Finally, I would remind everyone that **Seaview** is written by a 'journalist' who brings issues to the attention of the readers. I am not a scientist; nor have I ever professed to being one. However, I am staunchly opposed to cetaceans in captivity.

Inquisitive Dolphin Reef resident. The debate continues.

JACK JACKSON

M.P. & C. PEDIGIR

Healthy-looking Koi in crystal-clear water which looks to be in tip-top condition. But is it ...?

KOI AND TAPWATER

As **Ann Telford** of All Clear Water Purifiers explains, Koi — like all other fish — have to put up with a lot of things that they were never 'designed' for. We therefore owe it to them to provide the best water conditions possible.

Were Koi designed for tapwater? Perhaps a cynical answer to this question would be that if Koi were designed for tapwater, then they'd look like us! Yet, although we have one or two rather strange looking Koi in our pond, I can honestly say that not one of them looks human!

Evolution shows that viruses, bacteria and 'water-life' were the first living things on this planet. In time, some 'fish' crawled onto the land and developed into the first air breathing creatures, and gills changed into lungs. With many twists and turns in the tale, eventually *Homo sapiens* was born. It was man who organised water supplies and many thousands of years later devised water companies and tapwater. During this evolutionary period, it was also man who took over, gradually controlled and sometimes destroyed the environment.

Although fish went through their own evolutionary changes, they weren't the same as those occurring to us. The physiological needs of man and fish have remained very different. When fish evolved, tapwater had not been invented; they were never therefore designed for tapwater or for water that man had polluted.

Varied cocktail

Industry, tin mining, farming, highway cleansing, lead and copper supply pipes, as well as natural aluminium, etc., have all gradually added substances to the water we drink today. Even now, some pesticides used during the second world war are gradually finding their way through the land to natural water supplies.

Fish were not designed to tolerate levels of substances in water that are usually seen to be safe for people. I say usually, because one of the substances found in some areas of the country is simazine, and coldwater fish can safely tolerate 100 times more than is allowed for us. Fish and people are really very different in design!

A major breakthrough was the addition of chlorine to water supplies, as a result of which bacteria could be controlled and dysentery etc., eradicated. This was not for the benefit of fish, but to improve the health of people. Fish can tolerate only low levels of both free chlorine, and chloramine (fixed chlorine). Today's tapwater, with its added disinfectant of chlorine, is designed for the health of the population, and even if we don't like the smell or the taste, our bodies can handle far higher levels of chlorine than fish.

Set levels

The amounts of substances allowed to be present in tapwater are set by the amounts of those substances that people can ingest and tolerate without their physical health being damaged. We cannot expect or demand the water companies to provide water designed for fish; that is not their function.

If, we the hobbyists, want to dig holes in our backgardens, fill them with liners, pumps, biological filters and fish, then it is also our responsibility to provide the water quality the fish need for best health. We already expend a great deal of time and effort providing biological filtration, and it has long been the view that that is sufficient. Unfortunately, it is not so.

Biological filters are designed to control ammonia, nitrite and nitrate levels in particular. This can be exploited if unacceptable levels of these are in your tapwater. Why spend more money on yet another gadget when we already have such a disposal system linked to our ponds? Feed new water to the first bay of a biological filtration system, if necessary extend the filtration system to control the dreaded 'three', and long term, it will be more cost effective.

Sometimes we expect too much of our filters. For example, we expect them to reduce all the other substances found in tapwater. But bacteria cannot reduce free chlorine, chloramine, herbicides, pesticides, molluscicides (shrimp and worm killers) or heavy metals. The only one of these substances which can be sprayed or

SUBSTANCES IN DRINKING WATER

Substance	Drinking Water Standards for People (PCV's)	Fish Safe Levels

THE "DREADED" THREE

	Human Standard	Fish Safe Levels	Fish Kill Levels
Ammonia	0.5 mg/l	0.02 mg/l	1.0 mg/l
Nitrite	0.1 mg/l	0.1 mg/l	2.0 mg/l
Nitrate	50.0 mg/l	1.0 mg/l	100 mg/l

It is interesting to see that fish and people safety levels coincide with nitrite but vary widely with nitrate. It is more usual to find ammonium than ammonia in tapwater. Ammonium is safer for fish than ammonia.

Key: mg = milligrams = parts per million
µg = micrograms = parts per billion
l = litre

With acknowledgment to **Bernice Brewster** who collated the original chart information re: fish.

1 PESTICIDE, HERBICIDE & MOLLUSCICIDE GROUP

Aldrin	0.1 µg per litre	0.1 µg/l	13 µg/l
DDT	0.1 µg per litre	0.003 µg/l	8 µg/l
Pyrethrin	Unlisted	0.5 µg/l	0.001 µg/l
(Shrimp Killer — safest level is none — TURN OFF THE TAP)			
Simazine	0.1 µg/l	10 µg/l	10,000 µg/l

Safety levels vary widely in this group. Some amounts need to be lowered for fish, some are the same as for people, but simazine could be far higher for fish.

2 METALS GROUP

Aluminium	200 µg/l	50 µg/l	100 µg/l in low pH water
Copper (soft water)	3,000 µg/l	6 µg/l	30 µg/l
Copper (hard water)	3,000 µg/l	5-15 µg/l	3,000 µg/l
Iron	200 µg/l	30 µg/l	500 µg/l
Lead	50 µg/l	20 µg/l	1,000 µg/l
Zinc	5,000 µg/l	30 µg/l	400 µg/l

Again, the safe or best fish levels of substances vary widely. However, low and high pH levels, as well as soft and hard water, alter the effects of metals on fish. Metals are interactive, and if there is more than one metal in the water, it will increase the effect of both. We do not know when these interactions affect fish. It is because of these interactive factors that lead must be considered, as wide areas of the UK have lead present in tapwater.

3 TOTAL CHLORINE GROUP

Free Chlorine	No set standard	0.03/0.003 mg/l	0.1 mg/l
Chloramine	No set standard	Unlisted	

Choramine is Free Chlorine 'fixed' into water with ammonia to prevent its easy removal. We know that chloramine is more dangerous to coldwater fish than Free Chlorine. Chloramine has been found more widely spread throughout the UK than was expected. Sometimes it is included under the headings: Total or Residual Chlorine in drinking water reports, although it may not be specifically named.

gassed off is free chlorine. The rest have to be physically removed or reduced. Reduction is the key word. If we removed everything, we would have pure water and this is normally only achieved by distillation.

Aggressive water

Pure water is not appropriate for fish for a number of reasons. For example, pure water attracts 'dirt', and this can be a problem if your neighbour is spraying roses with chemicals!

It is also highly aggressive, which gives fish two major problems. Firstly, it dissolves metals. Therefore, having perhaps removed dissolved metals from the tapwater, they can then be reintroduced by the stripping of pumps etc.

Secondly, the pH factor can become unstable and swing between extremes. We know that Koi do tolerate quite a wide range of pH levels, *as long as the pH level does not alter rapidly.*

Fish absorb essential minerals through their skin, scales and gills; if we give them water which is too pure, we deny them the opportunity to acquire those elements which are a necessary part of their diet.

Let's return to tapwater. Generally speaking, aquarium hobbyists have been far more aware of the inherent problems for their fish if they use unadapted tapwater, than the hobbyist who specialises in keeping pondfish. This is probably because many tropical fish tend to be more sensitive to substances found in tapwater than their hardier cousins, Koi.

But that does not mean that our pondfish cope well with tapwater. Remember, tapwater is designed for people. Each supply zone has different water, therefore the responses of our fish will be different. At the worst scenario (and thankfully rare) whole pondfuls of fish can be, and on occasions have been, wiped out. As a midway trauma, gills, internal and reproductive organs, deformity of fry and young fish, skin and scale, etc., can be damaged. At the least?

The phrase "one degree under" is appropriate. The fish will not be quite as active as they should be, with knocks and bumps taking just that little bit too long to heal, intervention being needed where a fish should be able to heal naturally; affected fish also show tendency to fungal or bacterial infections. Sometimes there are no indications of what is happening to the fish, as effects can be slow and cumulative.

I think it is important to mention that older, larger fish tend to be less prone to damage than younger fish. The quality of Koi being imported has also radically altered in the last few years. Better colours and patterning have been achieved by selective breeding, this implying that Koi today have a finer pedigree than some years ago.

Frequently, pedigree livestock can be

Water purifiers reduce levels of many contaminants in tapwater, but always check that you've got the right model and type to suit your needs ... and always operate a purifier according to the manufacturer's instructions.

ALL CLEAR WATER PURIFIERS

WHAT'S HAPPENING IN YOUR WATER?

(1) Contact your water company and ask for a free Drinking Water Quality Report for your home.
(2) Find out if any substance levels need to be lowered, then take appropriate action.
(3) Register with your company as a fishkeeper so they can notify you when they 'pipe-flush' and use extra chlorine/chloramine, or use any substances to kill shrimps. When notified that either of those events is going to take place: DO NOT FEED NEW WATER TO THE POND EVEN IF YOU HAVE A WATER PURIFIER. Water purifiers reduce substances in water by a percentage — they do not remove them completely. Some substances are best kept away from fish.

HELPFUL HINTS

1. You need to know that the purifier you choose has been independently tested on UK tapwater and that the claims made by the supplier are independently validated.
2. Ensure that the purifier is rated for chloramine as well as free chlorine. Chloramine levels can be high and do not always show in drinking water reports.
3. The precise amounts of water a purifier will treat depends on your tapwater. Do replace purifying media at the right time for your water, to protect your fish.
4. Do not over-rely on water purifiers. If an extremely high amount of something like aluminium sulphate is released into your water accidentally, the purifier will only remove some of it, which may not be enough for your fish.
5. Always follow the instructions. Send water through too fast, and the purifier doesn't have enough time to do its job; sometimes you can even raise the chlorine levels!
6. Always flush water to waste before sending it to the pond if you have just bought your purifier, or replaced the media, or the purifier has been unused for some time.
7. Protect the purifier. It must not get too hot and *must not* be allowed to freeze.
8. Purifiers reduce essential minerals as well as contaminants, so make sure your fish are given a well-balanced diet and add vitamin and mineral supplements to the pond.
9. All of the Koi keeping skills you have always used are still as important as they have always been. The use of a water purifier does not replace them!!!!

more prone to health problems than the sturdier 'mongrel'. As both fish and water conditions have altered, the long term Koi keeper with older more established fish, is perhaps less likely to have encountered severe health problems than the newer fishkeeper, who has younger, and possibly less sturdy, fish. Alternatively, it might well be that if damage occurs to more established stock, it may be more subtle and less easily noticeable.

The accompanying charts show that some substances allowable in tapwater for people can be at fish kill levels; an example of this is copper in a soft-water area, but most substances are not at this level. Permissible amounts of different substances in tapwater are more likely to be at the level which impairs good fish health — that "one degree under" feeling. Or to put it another way: **Fish aren't designed for tapwater.**

Top tips

Having come to this conclusion, what can we — the fishkeepers — do about it?

We seriously need to consider adapting the 'people safe' tapwater, to redesign it, or rather, to adapt it to match fish needs more closely. The only way to be able to do so, is to use some form of water purification system to alter the water before it is introduced to the pond.

But what type of purifier should we use? It is important to remember that many purifiers are designed for people (i.e. domestic) or have been developed from systems originally intended for uses other than for fish. We have already seen that fish have their very own water requirements; therefore, they need purifiers designed for them.

But first, you need to know what is in your own water supply so that a purifier can be used correctly for *your* fish. I have listed some useful hints in the accompanying boxes entitled: **What's Happening to Your Water?** and **Helpful Hints.** I hope you find these useful. In the end, what we are all after are happy healthy Koi in our pools. **AKP**

FASCINATING FISH FACTS

Moonlight fling

Grunions spend most of their time doing what any California fish would normally do ... like swimming, and other such mindbending, exciting things like that.

SUE FARHURST

However, come the full moon, they are galvanised into a burst of sexual frenzy that has to be seen to be believed.

What they do is follow the tide (which is highest at this time of the month) in towards a deserted sandy beach. When the tide is at its peak, they fling themselves in their millions into the surf, with the females half-burying themselves in the wet sand and holding their heads straight up in the air.

Such females are immediately surrounded by 'highly motivated' males who fertilise her eggs as she releases them several inches under the surface. When it's all over, the exhausted fish flop their way back into the sea to recover.

The eggs then remain above the high tide mark for the next 12-14 days, until the following really high (spring) tide arrives. At that point, they all hatch out en masse and are washed out to sea — no doubt anxiously looking forward to the time when it's their turn to roll on some sandy beach under a full tropical moon!

SEAVIEW

BY GORDON KAY

Return of the whales

I don't know ... I mean, who do you believe? One week I read a newspaper that tells me that dolphins are fleeing British waters because of noise pollution, then — almost immediately — I read another that tells of cetaceans returning to their ancient feeding and spawning grounds around our coasts.

This new article was in *The Sunday Times* on 13 February and told of the Status Review of cetaceans in British and Irish Waters, which was started in 1973 and carried out with the help of more than 1000 volunteers, who reported 20,000 sightings of 22 individual species. The findings of the review will be published later in the year, but scientists have already said that we have reached a turning point in the fortunes of whales and dolphins after "decades of gloom in which extinction of the rarest marine mammals has been predicted".

The first signs of recovery thrown up were reports of Sperm Whales in Scotland and Minkes off Yorkshire. Humpback Whales had also been spotted off the Welsh coast and even Orcas (Killer Whales) had been seen off Lizard Point in Cornwall. The article also told how dolphins were coming into the English Channel in family groups.

JACK JACKSON

Dolphins and their close 'cousins', the large whales, are reportedly returning to British waters in ever-increasing numbers.

Co-ordinator for the survey, **Dr Peter Evans**, working for the D.O.E., said that "recovery was slow but significant in long-lived animals that had been hit by over-fishing, hunting and pollution". Fishing quotas, introduced in the 80's, very probably increased the food supply — allowing whales to flourish once the I.W.C. moratorium was installed. Results point to an increase in the numbers of four of the great whales appearing off British shores in the past five years.

Sixty-foot Fin Whales in deep waters off Southwest England and a rare Sei Whale spotted off Northern Ireland, gave me particular pleasure, and a report by the director of a whale-watching holiday firm on the Isle of Mull said that 30ft long Minke Whales were seen every day within three miles of the island.

A further sighting report told of 14 Bottle-nosed Dolphins cruising about 50 yards off the beach at Slapton Sands, near Dartmouth in Devon. Now, I was down there last summer and if I had seen that, I would've wet myself with excitement!

The increase in sightings coincide with an increase in strandings, which were up by 50% over the last 5 years. **David George** of the Natural History Museum reckons that this phenomenon was due to an increase in whales, rather than an increase in problems.

UK Director of WWF, **Dr Robin Pellen** said that this recovery, though fragile, showed the "remarkable recuperative powers" of Nature. He also called for extra help to protect the animals from industrial fishing and seismic testing by oil companies. Amen to that, but let us all hope and pray that the increase in whale numbers will not lead to increased pressure for a resumption in commercial whaling.

Weir porpoises

Still with cetaceans, the January issue of *Sonar* — the magazine of the **Whale and Dolphin Conservation Society** — carried

SNIPPETS

1

It would seem that the Blue Whale, frustrated at trying to find others to mate with, is mating with other species! Crosses of Blue with Minke Whales have been reported.

2

The total world water supply is some 1340 million cubic kilometres. All but 40 million of these are in the seas.

Just over 97% of all the water in the world is in the seas and oceans

3

Oceans are some 5000 times wider than they are deep. Only 1% is deeper than 6000 metres, 76% is between 3 and 6000 metres deep and 7% is between 200 and 3000 deep, leaving 16% covering the continental shelf.

4

If 100 tons of seawater were treated correctly, there would be enough gold produced to make a sovereign — yet, the 13 million tons of silver held in solution in the world's oceans are thousands more than man has ever mined.

JOHN DAVIS

an article about rescuing Harbour Porpoises in Canada.

Apparently, a joint initiative has been struck between the herring fishermen and conservationists to save the porpoises, which become trapped in the weirs — devices used for centuries in the Bay of Fundy — as they follow the herring into them. Whereas the fishermen would simply shoot the beasts in the past, they now work hard to remove them from their weirs unharmed.

The sequence of events goes like this. A fisherman calls to say there is a porpoise trapped in his weir (sometimes, of course, more than one). A time is agreed when the fishermen will use a seine net to remove the fish and volunteers take out two boats to meet the fishermen at the weir. Here, they watch closely to make sure that the porpoise doesn't get caught in a net fold.

The size of the net is slowly reduced until the porpoise remains at the surface. At this point, the animal is carefully lifted out and placed on thick foam in one of the boats. After examination and measurement, the porpoise is released, much to everyone's satisfaction.

Lovely stuff — and, as the article said, the long-term benefits gained by raising community awareness of conservation issues through such co-operation cannot be underestimated.

Deep search

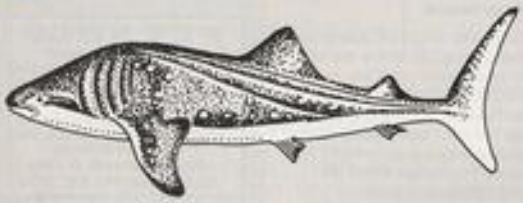
It seems that, after almost exhausting the stocks of more traditional food species around our shores, we are now turning our attention to deeper waters and species such as the Onion-eyed Grenadier and the Orange Roughly.

Apparently, several continental countries have been harvesting species such as these off the Scottish continental shelf, at depths of up to 1500 metres — to the tune of 20m a year!

Now, British fishermen are discussing following their lead, but will have their work cut out to sell the fish to the conservative Brits.

It will be interesting to follow their progress.

FASCINATING FISH FACTS



Peaceful giant

Despite its name, the Whale Shark is not a whale, nor does it conform to the widely-held, and largely incorrect, picture of sharks as vicious killers.

The Whale Shark is the largest living fish, measuring as much as 60 feet (18 metres) in length and weighing up to 20 tons (over 20,000 kg).

Its numerous small teeth are arranged in over 300 bands, forming a rough surface, rather than a sharp, cutting one. Its scientific name, *Rhincodon*, actually means "File Tooth".

The diet of the Whale Shark consists largely of shrimps, and the other small free-swimming sea creatures that go to form plankton — although the stomach of one particular specimen yielded a boot (minus foot!), a tin bucket (plus handle), a wallet (minus its owner!) and part of an oar (minus the boat!)

Whale Sharks are peaceful creatures which often allow divers to approach them and even hitch rides on their backs and fins.

DISCUSSI

BY STEVE DUDLEY

Discus buying tips

The first thing to do when buying Discus is to observe their behaviour. Healthy fish are inquisitive and will 'greet' you by rushing to the front of the tank, assuming it is feeding time!

Discus that cover or stay at the back of the aquarium are not necessarily unhealthy, however, unless they appear to have very dark coloration, which masks their usual colour. If so, this is probably due to stressful conditions in which they are being kept. Normally, their keeper, if experienced, would not offer them for sale, for obvious reasons.

The fish should appear to have a small round eye, a nice round shape and a full stomach. Fish that are fed on a regular basis, have dark faeces, which detach immediately; those that are not fed on a regular basis have stringy, paler faeces which remain attached.

Discus that have been kept on a healthy diet, will be full-bodied and not thin. A razor-shape over the head region, large eyes and a sunken belly are all evidence of past sickness and poor diet.

Three Essential Vitamins

Lack of vitamins will place Discus in jeopardy and — if not corrected — deficiencies will come to light sooner or later.

1 Vitamin A

This vitamin helps the regeneration of damaged body tissue and provides fish with intense coloration. Vitamin A is found in all plants and vegetables. The main source is found in carotene, which is orange in colour, hence the derivation of 'carrot'.

BILLY WHITESIDE

Young Discus rarely experience carotene deficiency problems since Brine Shrimp — one of the most widely used fry foods — contain an ample supply.

Carotene is also found in newly hatched Brine Shrimp and in a sea plant called *Dunaliella*, which grows on the sun-drenched coast of Hawaii.

Fish digest and convert carotene as required, so you will never see Discus fry deficient in Vitamin A, because newly hatched Brine Shrimp tend to be supplied as fry food in large quantities, for several weeks at least, until the young fish can take larger morsels.

2 Vitamin B

This complex group comprises B2, B6 and B12, which help to promote colour and vitality. They also help in the processing of carbohydrates, which, in turn, are converted into energy.

3 Vitamin C

This is yet another vital component of the Discus diet. Vitamin C is also found in vegetable matter and will help maintain the growth of healthy bones, as well as deter poor growth.

Discus lacking in this vitamin can end up with short gill plates.

All the vitamins mentioned above are of vital importance and should be included in most diets. Manufacturers understand this, of course, and consequently incorporate them into their products; many such foods are now available.

In their wild state, Discus browse and graze on plants and other vegetable matter such as fruit and berries; they also consume various live foods, all of which harbour these essential vitamins. Therefore, in the closed environment of our aquarium, we need to help duplicate such vitamin supplies in the food we supply, thus promoting a longer lifespan, vitality and good health in our fish.

Hole-in-the-Head

This disease can be quite a problem with cichlids, especially Discus. It is seldom seen in tank-bred varieties, although it can still be observed in older specimens. Hole-in-the-Head is mainly apparent in the wild species, especially so when they have been kept in captivity for some-time. The question must be asked if this is due to ignorance on the part of keepers who may not be familiar with the diet and water conditions required by Discus.

Discus are particularly susceptible to this condition because of tiny glands around the head region. If you were to look closely, you would be able to see these glands just above the eyes. The small holes you'll see are quite normal; they are mucus glands which cover the entire body but can't easily be detected because they are covered by the scales. The mucus which the glands produce provide protection for the epidermis.

LANCE JEPSON

Hole-in-the-Head: raised temperatures may help tackle the problem. This specimen shows enlarged pores during the early stages of the disease, plus characteristic stringy faeces.

When Discus are not fed the correct diet, and when water quality is very poor, these glands invariably become infected by *Hexamita*, a parasite which is found in small numbers in the intestines of the fish, along with several other flagellates.

When fish are moved, they are obviously subjected to stress. Some get over it quickly, while others can take weeks to settle down. The refusal of food during this time allows flagellates to multiply at great speed and these soon infect the intestines. These parasites are then, in turn, passed as waste. Transmission is therefore through ingestion by other Discus as they pick food and excrement from the aquarium floor.

If your Discus become listless, with white stringy faeces, it could well be that they are infected. However, unless you own a microscope, you will not be able to diagnose what parasite you are dealing with, as *Spironucleus* and *Octomitus* also show the same kind of symptoms.

Faced with a situation like this, it is common practice to raise the temperature to at least 35°C (95°F) for 4-6 days. This will normally kill the parasites, speed up the metabolism and, hopefully, induce the Discus to take food.

If the problem persists, then consult a vet who is involved with tropical fish, or buy yourself a good book and microscope.

IONS

which would be far more rewarding than guessing.

Seeds of success

It is a well known fact that healthy larger specimens are much easier to look after than juveniles. This is because they do not need as much attention in terms of feeding, water changes etc. Unfortunately, such fish are more expensive ... or are they?

Most newcomers to Discus are well into fishkeeping already and wish to set up a new aquarium in which to house several young Discus.

These young fish will need frequent feeds of high protein food, such as frozen heart, so will the new filter be capable of handling so much waste, so soon?

In order to combat this problem of impatience, it would be wise to 'seed' a new filter in an established aquarium for about one month, at which point it can then be transferred to your newly acquired tank on the day you expect to receive your Discus. This way, they will, at least, not have to be exposed to New Tank Syndrome problems, this being the cause of many deaths of baby Discus.

Avoiding 'Small-fish Syndrome'

Among any six young Discus, there always appears to be what is termed as "the runt". Everyone has one such runt, one fish that is always picked on by the rest of its brethren, and which is always last on the food.

This situation can be avoided if there are more Discus in the tank, since this helps to eliminate territorial behaviour. Discus are much more peaceful and calm when kept in large shoals; they also tend to be easier to look after in shoals.

Alternatively, you could offer food in different parts of the aquarium at feeding times if you own smaller numbers of Discus. This way, the bullies can't hog all the food, giving the less boisterous fish a chance to have their fair share as well. This technique will also help prevent domination of one area, where food would normally congregate.

Golden Rules

1. Always offer a varied diet.
2. Never use live *Tubifex* as it harbours toxic substances.
3. Never allow TANK-bred Discus to be kept in cool water less than 82°F (28°C).
4. Always have top-up water conditioned and unheated (at room temp). It is not essential to heat up water for replacement ... providing that you are not changing more than 10% at one time.
5. When checking the pH, try to do it at the same time each day, as carbon dioxide levels fluctuate but are usually about constant at the same time each day. This is, obviously, influenced by other numerous factors also being constant.

70 PRIZES TO BE WON IN OUR 70th BIRTHDAY JOHN ALLAN COMPETITION

To celebrate our 70th birthday, **John Allan Aquariums Ltd.** of Bury St. Edmunds are giving away **70 super prizes**... one for each year of our long, colourful and always-pulsating life.

In total, we have nearly **£600** to give away in prizes, from a super **£320 John Allan Supreme Combination Set,** to no fewer than **67** prizes of **Sera** products, taking in some great **Eheim** second and third prizes on the way.

THE PRIZES

FIRST PRIZE
John Allan Supreme Combination Set comprising:
36 x 12 x 25in **Regal** cabinet in mahogany finish
36 x 12 x 18in (h) **Horizon** aquarium
36 x 12in **Supreme** hood
Eheim 2313 Thermo Filter
Value: £320

SECOND PRIZE
Eheim 2211 Filter
Value: £62

THIRD PRIZE
Eheim 2006 Filter
Value: £22.20

CONSOLATION PRIZES
36 prizes, each consisting of a 100ml bottle of **Sera Aqutan** Water Conditioner
31 prizes, each consisting of a 100ml tub of **Sera Vipan** Staple Food Flakes.

THE COMPETITION

Here's what you do:

1. Read **Stephen Smith's** article **Back to the Future** in this issue of *A&P*.
2. Answer the competition questions.
3. Send in your completed entry, bearing your **FULL NAME AND ADDRESS,** to our offices to reach us by **1 June** at the latest.
4. Make sure that you order a copy of the **July** issue of *Aquarist & Pondkeeper* to see if you are among the 70 lucky winners.

THE QUESTIONS

1. When it was first published, *A&P* had a different name. What was this name?
2. On what month of what year did *A&P* first appear ... under its original name?
3. What was the name of our first-ever editor?

THE RULES

1. Write your answers to the competition questions on a postcard or stuck down envelope.
2. Write your FULL name, i.e. including full first name and address, in **BLOCK CAPITALS** on your entry.
3. Send your completed entry to:
   John Allan A&P 70th Birthday Competition, Aquarist & Pondkeeper, 9 Tufton Street, Ashford, Kent, TN23 1QN.
4. Closing date: entries must be received by **1 June 1994** at the latest.
5. Only **ONE** entry per household will be accepted.
6. No correspondence will be entered into regarding the competition.
7. The judges' decision will be final.
8. No responsibility is accepted for entries lost, delayed or damaged in the post, and proof of posting will not be accepted as proof of delivery.
9. The **first** correct entry drawn on **2 June** will be awarded the top prize.
10. The next **two** correct entries will each receive the second and third prizes respectively.
11. The following **36** correct entries will each receive one of the Sera Aqutan consolation prizes, while the next **31** correct entries will each be awarded one of the Sera Vipan consolation prizes.
12. The winners' names will be announced in the **July 1994** issue of *Aquarist & Pondkeeper*.
13. This competition is open to all UK readers of *Aquarist & Pondkeeper*, but not employees or their families of ***Aquarist & Pondkeeper*, Dog World Ltd., Pet Business World, or John Allan Aquariums Ltd.**

TRAVELLER'S TALES

David Ford Captures Illegal Immigrants!

No, not me, but Inspector David Ford of the National Rivers Authority, who has the job of rounding up Signal Crayfish that are breeding in rivers in the Trent Basin in the Midlands.

The Signal Crayfish is an American lobster that somehow escaped from captivity and has started breeding in our waters. This is bad news for our own crayfish, the English White Claw, because the USA species is more aggressive and up to three times larger. It will also successfully compete with the British crustacean for food and will win any fights over territory.

It may also introduce diseases and parasites for which our species has no natural resistance, especially a fungus called *Aphanomyces astaci* that can become a fatal epidemic.

At Nottingham University, Professor David Holdich studies crayfish and has plots of their populations in the UK. At the moment, the White Claw is mainly found in the Derbyshire Peaks, the Lake District and Northumbria, so it is important that the American Signal Crayfish is stopped from spreading from the Midlands.

This is where Inspector Ford comes in. Using special traps devised by the University and the NRA, he has already captured thousands of the invaders.

Austropotamobius pallipes, the English White Claw, is too small to be eaten by humans, but the European cousin, *Astacus fluviatilis*, or Red Claw, is not only eaten, but is also widely farmed as a delicacy on the Continent. Shipped to our restaurants (especially French food restaurants) the live crustacea have escaped (they can walk over wet grass to the nearest river) to colonise London's waterways.

It is claimed that enterprising Hamstead Heath anglers capture the Red Claw via chunks of meat on a line at night-time (they are nocturnal feeders) and export them to France as English miniature lobsters ...!

There are stories of Turkish Crayfish escaping from Billingsgate Market and even Nobel Crayfish from Sweden setting up home in England. Released pets have also been found, such as the Red Swamp Crayfish from Louisiana, which are sold to aquarists as Red Lobsters. These semi-tropical crayfish do not survive our winters, but the American Signal Crayfish finds our winters quite mild, each female producing over 2,000 offspring every spring.

NATIONAL RIVERS AUTHORITY

Inspector David Ford captures an American invader.

Mating pair of Louisiana Red Swamp Crayfish ... plus onlooker. This species is usually sold as the Red Lobster.

JOHN DAVIS

JOHN DAVIS

HARRY GRIER/FLORIDA TROPICAL FISH FARMS ASSOCIATION

Above, our native crayfish — the White Claw — under threat from 'illegal' immigrants (?).

Left, a semi-tropical crayfish for sale in a UK aquarium shop. These warm water crustacea are not a threat.

Aquarian's **Dr David Ford** continues his aquatic travels with a story of invaders of the crayfish world.

Some foreign crayfish have been classified as pests under the Countryside and Wildlife Act of 1981, but the Department of the Environment is considering banning all non-native crayfish in sensitive areas of Britain.

You can do your bit by never releasing pet 'lobsters' (they will be crayfish really) from your aquarium ... and never add them to your pond. Except the English White Claw, of course — because they live here!

KOI CALENDAR

BY DAVID TWIGG

Jobs for the month

May is the month of the year which can probably be called the beginning of the British 'Koi Summer'. Water temperature is rising with the increase in daylight hours, and water quality is under attack from the temptation to feed a bit more than one should, and the algae are also taking a hold.

Green water is easily controlled these days by the use of Ultra-Violet Sterilisers (UVS) or Clarifiers (UVC), as they are sometimes known, but overloading the filter by increasing feeding rate too quickly is much more difficult to deal with.

It is probably better to avoid overfeeding if at all possible. I use a plastic cup as my measure of food quantity. While the actual weight is not known accurately, the volume is. This means that by keeping a track of the number of cupfuls of food given each day, I can keep an even load on the filter. Increasing quantity with rising temperature is also easy to achieve; the only problem is remembering to log each cupful as it is given!

Towards the end of this month, when the light evenings make pondside relaxation a very pleasurable experience (English weather permitting!), we will be lounging by the pondside, reading *A&P*, watching our Koi swimming lazily around and probably throwing handfuls of food into the pond which our pets will be consuming with great relish.

Please watch the water quality though, because it is very easy to overload the biological filter under these circumstances, particularly a newly established system.

Increasing water temperature also means that there is less oxygen in the water available to support Koi. The use of pump-driven air stones in the pond is the norm now in Koi circles to compensate for this reduction, and these greatly increase the available oxygen supply.

What's on in May

1 — Northern Section BKKS. *Coach trip to Telford Show.* Contact **Phil Adamson,** 051 220 2970.
Crouch Valley Section BKKS. *Auction.* Contact **Ron Parlour,** 0277 840863.
3 — Yorkshire Section BKKS. *Monthly meeting.* Contact **Phil Swallow,** 0422 343674.
4 — Leicestershire Koi Society. *AGM,* British Shoe Corporation Social Club, Scudamor Road, Leicester. Contact **Pip Ostell,** 0533 609707 or **Kevin Luckman,** 0455 250413.
5 — Middlesex & Surrey Borders Section BKKS. Guest speakers **Kevin Jackson** and **Lloyd Bartley** on *Putting on a Show.* 8pm, Norbiton CIU Club, Kingston. Contact **Gary Pritchard,** 081 841 2894.
7 — Northern Koi Club. *Monthly meeting and auction.* Warrington. Contact **Tony McCann,** 061 794 1958.
8 — Lea Valley & Harlow Section BKKS. *Monthly meeting,* 3pm, Hailing Hill Common Room, Harlow. Contact **Phil Davis,** 0279 443754.
— Central Section BKKS. *Open Forum,* T.P. Riley Community Centre, Bloxwich. Contact **Sue Finney,** 021 747 2733.
9 — West Wales Section BKKS. *Monthly meeting.* Post Office Club, Swansea. Contact **Andy Tovey,** 0554 821310.
— Northampton Section BKKS. *Monthly meeting.* Saints Social Club. Contact **John Byles,** 0604 718648.
10 — Nottingham & District Section BKKS. *Open Forum,* The Western Club, Derby Road, Nottingham, 8pm. Contact **Shirley Hind,** 0602 810923.
11 — Merseyside Section BKKS. *AGM,* Millbrook Manor Restaurant, Knowsley Village. Contact **Robbie,** 051 549 2001.
— South Hants Section BKKS. *Club meeting,* 8pm, Denmead Church Hall, Hambledon Road, Denmead, Hants. Contact **George Rooney,** 0420 473169.
14 — Heart of England Koi Society. Speaker is **Tony McCann,** Chairman Northern Koi Club and former Chairman BKKS. Meeting in Warwick. Contact **me,** 0926 495213.
15 — Crouch Valley Section BKKS. *Visit Lower Thames Section ponds.* Contact **Ron Parlour,** 0277 840863.
— Mid Somerset Section BKKS. *Members' pond visits.* Contact **Alan Purnell,** 0458 72132.
— Central Section BKKS *entertain the Norwich Section BKKS.* Contact **Sue Finney,** 021 747 2733.
— South Hants Section BKKS, *visit the ponds of Middlesex & Surrey Borders Section BKKS.* Contact **George Rooney,** 0420 473169.
— Lea Valley & Harlow Section BKKS *entertain members of Worthing & District BKKS.* Contact **Phil Davis,** 0279 443754.
18 — Crouch Valley Section BKKS. *Pre-show discussion on Koi Appreciation with* **Alan Rogers.** Laindon Community Centre, Essex. Contact **Ron Parlour,** 0277 840863.
22 — Leicestershire Koi Society. *Club trips to see Northampton Section BKKS ponds.* Contact **Pip Ostell,** 0533 609707 or **Kevin Luckman,** 0455 250413.
— Northern Koi Club. *Coach trip to Koi Show Nr. Nottingham.* Contact **Tony McCann,** 061 794 1958.
— Central Section BKKS. *Visit to Taunton Section BKKS.* Contact **Sue Finney,** 021 747 2733.
28/29/30 — Northern Koi Club. *Weekend trip to Peterborough & Cambridge and Norwich Sections, BKKS.* Contact **Tony McCann,** 061 794 1958.

Show Calendar

I have been reading recently of how our hobby is spreading around the world. Koi keepers in Germany first got together in 1991 and founded the **Koi Liebhaber am Niederrhein** (Koi lovers of the Lower Rhine).

'KLAN' members have been coming to England to visit the BKKS National shows for some years now, and this year they are holding their very own International Koi Show in the Rhein-Ruhr-Halle in Duisburg, Germany on **18 and 19 June.** This show, sponsored by **Tetra,** and with judges coming from Japan, sounds as if it would make the basis of a good weekend away from it all!

This month sees five Koi shows in the **Calendar,** four of them over the Bank Holiday weekend. The locations of these shows are diverse, ranging from Kent in the South East, to Merseyside in the North. The South West has the Avon Section Show in Bristol, and the South Coast has the South Hants Show at Crookhorn.

May
21/22 — *Koi Show,* Stapleford, Nottingham hosted by Japanese

Water Gardens and Clear Water Koi Direct.

29 — South East of England Section BKKS *Closed Show*, Koi Water Barn, Chelsfield, Nr. Orpington, Kent.

29/30 — South Hants Section BKKS *Open Show*, South Downs College, Crookhorn. **George Rooney** tells me there will be 10 dealers attending this indoor show and there will be Koi videos, lectures and a Craft Fair going on all weekend. The entrance fee of £1.50 (50p children) includes a show programme. Contact **Denis Carter,** 0243 371456.

— Merseyside Section BKKS *Open Show*, Camphill Park, Woolton, Liverpool. This show is taking place over the Bank Holiday weekend and will open its doors to the public at 10am on both days. It will include National as well as local Koi dealers, a large craft fair, side stalls and lots of other attractions for all of the family. If you would like to show your Koi, contact **Bob Pearson,** 051 733 8494 or **Terry Gavin**, 051 425 3603. Any other information can be obtained by contacting **David Pye**, 0925 267627.

30 — Avon Section BKKS *Closed Show*. Part of the North Somerset Show at Ashton Court, Bristol. Contact **Dave Knowles,** 0454 774676.

BILLY WHITEHEAD

Pondside relaxation — one of the great delights of Koi keeping.

An invitation

I would like to invite all Koi Club Secretaries or PROs' to send me their latest calendar for inclusion in my column and to thank all those who have kept me in touch to date. 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. Ideally, I need to have information at least 10 weeks before the date of the event to guarantee publication. You may, of course, ring me direct on 0926 495213 which will allow a little leeway. This request also applies to dealers with special events, auctions, etc. I look forward to hearing from you.

All Koi keepers are welcomed to the events mentiond in this calendar (an entry fee may be payable). Further details can be obtained from the contact telephone number quoted alongside the diary entry.

Please write to me at your earliest convenience via the Editor at **9 Tufton Street, Ashford, Kent TN23 1QN**. Thank you.

CALIFORNIA GIANT FO

PART 2

The unique setting of Sequoia National Park forms the backdrop to **Marc Staniszewski's** second trek in search of Californian salamanders

Photographs and map by the author

After leaving Big Sur and continuing to follow the 'Scenic Highway', the climate became steadily drier and more uncomfortable, so I moved inland across the Californian Basin. This partial rain shadow area, shielded from coastal influences by the Santa Lucia and Coast Range mountains, and from cool interior winds from the east by the Sierra Nevadas, consists of many thousands of square miles of flat, arid pans utilised for rye, corn and cotton, all served by a huge network of man-made aquaducts.

Even here, Red-tailed Hawks sat poised in their thousands on the telephone cables lining the road as if waiting for something to happen. Black tarantulas crawled purposely across the shimmering roads while, in the aqueducts, White Herons stalked the waters for fish.

Ten hours after leaving Big Sur, the basin and the heat seemed incessant, but just as I wondered if lush greenery really existed, the car passed the sign I had been urging to appear: 'SEQUOIA NATIONAL PARK — 107km).

Three Rivers

After stopping off at a motel 12km from the park, my exhaustion impeded me from surveying the area until the following morning. The motel sat on the outskirts of a delightful old Apache settlement called Three Rivers and the surrounding terrain was breathtaking — a huge lake hugged by golden foothills down which ran a sparkling river. Outside, the sky was cloudless and pearly blue, although the air held a chill, causing a dew to cling to every golden blade of grass.

The expanse of water a few miles away was Lake Kaweah which was fed by the Kaweah River, a cold, fast-moving river whose source is from the 13,802ft Mount Kaweah in the highlands of the Sequoia National Park.

I spent several hours searching the banks of the river and the lake and, as with the coast, the Californian Slender Salamander was the predominant amphibian. Foothill Yellow-legged Frogs (*Rana boylei boylei*) were common under large pebbles that formed much of the river banks while, on top of the pebbles, large, spotted Whiptail Lizards (*Cnemidophorus*

1 Sequoia National Park is home to some of the tallest trees in the world.

2 The deceptively harmless California Newt.

3 The most attractive of California's salamanders, the Sierra Ensatina.

4 The gigantic Banana Slug is partly responsible for the survival of the Sequoias themselves (see text for details).

tigris) flattened their bodies to absorb every warming ray of the autumnal sunlight.

At six o'clock the following morning I was already at the entrance to Sequoia National Park. The temperature plummeted from 54°F (12°C) in Three Rivers (900ft — c 275m) to 38°F (3°C) at the park headquarters (1,700ft — c 520m) and from there, a 30-mile winding, often precarious, road took me to the protected, humid reaches of the celebrated Giant Forest over 6,500ft (nearly 2,000m) above sea level.

Just standing in the midst of the majestic Giant Sequoia (*Sequoia gigantea*) groves is an incredible experience. Mist clings to the incredibly fertile forest floor littered with the remains of trees too old and massive for the shallow roots to support their great weight.

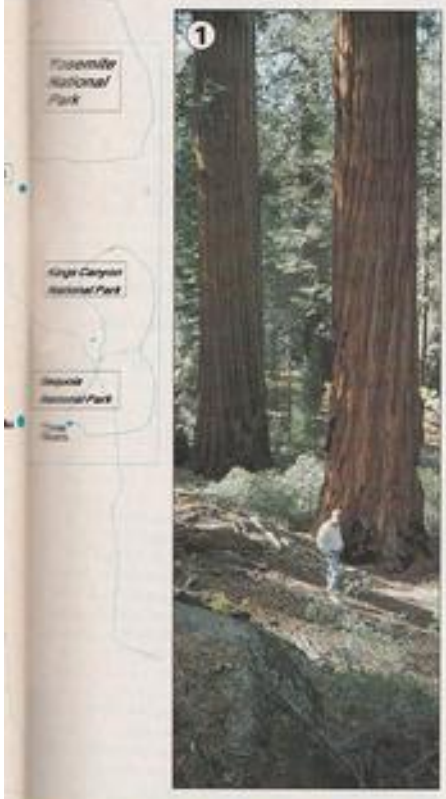
Forest giants

The 300-feet (90-m), 3,000-year-old Sequoia here may not be as tall as their coastal sister, but they are considerably greater in bulk, with the world's largest living thing — the General Sherman — weighing in at around 1,250 tons!

Walking through the groves is like walking across a giant sponge, for the earth consists of thouands of years of rotting corky bark and wood swelled by the surrounding moisture. Fallen giants often take as long as 5,000 years to decompose, such is the resilience of the wood.

The whole floor is alive with invertebrates ranging from 6-inch orange-red centipedes, to a huge bright-yellow land

ORESTS ...AND SLUGS



mollusc aptly named the Banana Slug. The survival of the Sequoia can be partly attributed to these 10-inch slugs because they break down the contents of fallen branches, leaves and trees and thereby restrict the growth of potentially harmful bacteria and fungi.

In some areas it was difficult to move without treading on one of these lurid invertebrates, and attempting to pull off the frothing, slimy body from a shoe is a nightmare. They can present slippery hazards where scaling rocky outcrops is concerned. Thank goodness the ground was so soft!

Ensatinas and toxic newts

Sequoia National Park also revealed perhaps the most attractive Californian salamander confined to the middle Sierras where it thrives in the cool, moist conditions and profusion of invertebrate foods.

The Sierra Ensatina or Painted Salamander (*Ensatina eschscholtzi platensis*) has a black dorsum, revealing irregular blotches of orange, red or yellow, depending on the exact location. Many specimens were concealed beneath the soaking wood of fallen Sequoias and overall, they tended to be slightly larger and more bulky than the nominate coastal Monterey Ensatina discovered in Big Sur.

In summer/early fall, after mating, the females seek a suitably damp, cool rotting log where they will deposit up to 20 largish, opaque eggs. Due to the occurrence of continual bio-decomposition, the female frequently releases a mucal secretion over the eggs which not only ensures they remain sufficiently moist, but also prevents fungal attack.

After 12-15 weeks of stubborn attention, when the female (and occasionally the male) repel potential predators such as small snakes, alligator lizards and rodents by emitting a foul-smelling/evil-tasting substance from the base of the tail, the fully-developed babies hatch out and disperse to fend for themselves.

These inch-long juveniles are exact replicas of the parents, apart from the disproportionately large head that enables them to consume fairly large prey.

Even though I visited the park during the time of year when juveniles should have been abundant, only adults were seen, so I therefore assumed that juveniles avoid surface activity during the early stages of their life to avoid predation.

Many brooks and creeks crisscross Sequoia National, and where groups of rocks form an obstacle against the flow, the water congregates to form relatively shallow, still pools. These are extremely cold and rich in algae, presenting idyllic conditions for the only newt species indigenous to the Sierra Nevadas.

The stocky, brick-red California Newt (*Taricha torosa*) is rarely seen on the surface during summer to late winter, but I was fortunate enough to locate several pools teeming with large, well-developed larvae, while under nearby log hid some adults.

Apparently, during heavy rainfall and early spring, thousands of these conspicuous 7-inch newts migrate from their resting places to such pools. Many larvae are flushed out by torrential rains to lowland lakes, which explains the greater abundance in the foothills, rather than the mid-Sierras.

California Newts are well protected from predation by means of a virulent skin poison, called tetrodotoxin, which is capable of causing skin and breathing irritation in humans simply through handling (0.0001g is sufficient to kill 7,000 mice!).

Unsuccessful trek

A further two days were engaged trekking Sequoia National Park, particularly the harsh granite-strewn upper regions of an area known as the Silliman Pass (10,000ft — 3,000m) in an unsuccessful search for the scarce Mount Lyell Salamander (*Hydromantes platycephalus*), a species known only from scattered populations throughout the central Sierras.

Next time, I shall visit the area during early fall, before the onset of bitterly cold conditions and widespread frost which were evident here from the glazed surface of many small lakes and passes. Indeed, conditions were cold enough to stop my camera from functioning correctly.

Apparently, this 5½-inch salamander uses the suckered tip of its flattened tail to gain purchase on slippery wet granite rocks; it also possesses a long, sticky tongue for catching invertebrates.

I would certainly recommend anyone to explore the Sequoia National Park. It is a place of such curiosity and powerful landscapes that it holds my fondest memories of the whole trip.

(TO BE CONTINUED)

Part 1 of Marc Staniszewski's Californian adventure was published in the February issue of *A&P*. Still to come: Marc's trip to the Big Basin — a paradise for herpetologists. Watch out for it in a few months' time.

97 SPECIES AND COUNTING...

PART 2 From Silkworms to Rotifers

Colin Grist, editor of the IMAA's *Marine Aquarium Journal*, traces the history of failures and successes in our attempts to breed tropical marines in captivity.

There is still much to be learned in the relatively new science of marine fish and invertebrate breeding, but it is surprising how long ago it was when the first successful spawnings actually occurred. Possibly the earliest report on spawning Anemonefishes in an aquarium was written by Verwey in 1930, with many more by different authors following over the next few decades.

In 1951 Garnaud reported on an interesting captive Anemonefish spawning where a clay plant pot was used as a substitute for an anemone, proving the point that Anemonefishes are not totally dependent on host anemones. Garnaud also wrote a paper in 1950 on a successful aquarium spawning of the Cardinalfish, *Apogon imberbis*.

The earliest detailed report I have been able to find on rearing larval Anemonefishes in an aquarium was published in 1963, based on the work of Otto Koenig who, at the time, was Director of the Willhelminenberg Biological Station near Vienna in Austria.

Early concoctions

Among other facts, Koenig realised the importance of light to enable the larval fishes to feed. The food itself that he used was a strange, complex concoction, as he mixed together seawater, blood-meal, bone-meal and fish-meal, egg-yolk, dried shrimps, mussel flesh, dried cod liver oil, germinating wheat, fresh oatmeal and grated silkworm pupae (Wow!).

He also added Vitamins A, B_1, B_2, B_{12}, D and T and also nicotinamide and chlorophyll. The mixture was sieved and kept in a refrigerator until needed.

Over the top, you might say, but it certainly worked! Mind you, in the cases of rearing Anemonefishes, there have been reports of limited successes where only proprietary fry foods, or even just finely powdered flake foods have been used.

Many people in the early days assumed larvae of most species fed on phytoplankton (microscopic algae), a mistake which hindered the development of rearing techniques for some time.

In the early 70's, while an assistant at the aquarium of Merseyside County Museums, I was involved in attempting to rear the Domino Damselfish, *Dascyllus trimaculatus*.

The museum maintained a group of several very large breeding pairs in a 400+ gallon system, but, due to making the same mistake, the larvae rarely survived longer than the third day after becoming free-swimming.

Researchers at Bangor University in North Wales (and possibly other establishments) later discovered larval Damselfishes could not digest chlorophyll, and that this was probably the case for a large number of other species. Despite the proof that fry do not eat algae, it has been found that many species will not spawn easily, or the offspring do not survive, in systems where there is not a lush growth of green algae covering the sides and rocks within.

Shrimps and rotifers

It seemed a natural progression to use newly hatched *Artemia* (Brine Shrimp), as these were very successful in the rearing of fry from freshwater species, and with the added advantage that they would survive in saltwater until eaten. Unfortunately, the fry

NOTABLE FAILURES

1 BOXING SHRIMP (*Stenopus hispidus*)
After a successful hatching, it was discovered the tiny young replicas of their parents have, from the word go, the same aggressive territorial behaviour, and very quickly set to killing and eating as many of their brothers and sisters as possible! Only the most aggressive survive.

2 ANGLERFISH (*Antennarius* sp)
An attempt to mate a pair of this species resulted in the female devouring its partner, thus bringing this particular project to an abrupt halt. These fishes are highly predatory and don't mind too much about eating their own kind!

Right, Damsels — and their close relatives the Clowns — are undoubtedly among the easiest marines to spawn and rear in aquaria. GORDON WIGENS

Among the notable failures is one in which a female Anglerfish swallowed her prospective mate! JOHN DAVIES

Right, shrimps have proved very challenging to breed. However, some species like the Blood Shrimp (*Lysmata debelius*) have not only been bred recently, but their larvae have been successfully reared. We hope to bring you a full report in *A&P* before too long.

BREEDING MARINES

SOME NOTABLE SUCCESSES

1 JAPANESE BUTTERFLYFISH
(*Chaetodon nippon*)

This species was reported to have spawned in an aquarium by Suzuki, Tanaka and Hioki in 1980. The aquarium was a large, but heavily populated, community tank, and repeated spawnings by the Butterflyfishes were observed.

Attempts to raise the fry were unsuccessful beyond the eighth day. Nevertheless, this is very encouraging for the aquarist, considering Butterflyfishes are, in the main, difficult to keep even in normal situations.

2 GREY ANGELFISH
(*Pomacanthus arcuatus*)

This tropical Western Atlantic species is a typical large Pomacanthid, and, as such, would normally be regarded as one of the most unlikely to spawn in captivity. In 1976, Martin Moe reported how he had managed to rear these Angelfish successfully after stripping ripe parent fish and then mixing the gametes (sperm and eggs) in bowls of seawater.

However, back in 1959, Straughan reported an actual aquarium spawning of this species, perhaps proving the point that nothing is impossible.

3 PORCUPINE PUFFERFISH
(*Diodon holocanthus*)

In 1978, Sakamoto and Suzuki reported on the aquarium spawning of this species. It was a large tank in a public aquarium and they succeeded in rearing the larvae.

In contrast to this, there is a report from Wolfsheimer (1957) on a pair of *D. holocanthus* spawning in a 30-gallon aquarium. The larvae were not successfully reared on this occasion.

of coral reef fishes are, in general, much smaller than those of freshwater species, and the *Artemia* proved too large — although they are an excellent food for when the fry have grown some over a few days.

The real breakthrough came when rotifers, in particular *Brachionus plicatilis*, were tried. These had more or less revolutionised larvae rearing in hatcheries producing flatfishes for human consumption. It was found that newly hatched larvae of most species could easily ingest these microscopic organisms and would grow at an acceptable rate.

Dark success

All sorts of aquaria and other containers have been used with success when spawning and rearing coral reef species, but the greatest larval survival rate is usually achieved when they are initially reared in plain, dark-coloured containers with a wide rim to cast a shadow down the insides.

The shadow is important because the larvae of most species are naturally attracted to light (they are positively phototactic) and will therefore remain gathered in the illuminated central column of the container, and thus are prevented from damaging themselves against the sides.

Filtration is not necessary, although some authorities use very light aeration. I have often used black plastic dustbins as rearing containers.

Living rock solution

At the Marine Science Institute of the University of Texas in America, researchers Dr Joan Hunt and Cecilia Riley have been successfully spawning and rearing very large numbers of reef species, several of them being 'firsts'.

They use only the most basic of equipment. For example, water circulation is achieved by using air lifts to deliver the aquarium water to external biological filters before it returns to the tank, and illumination is provided by a couple of standard flourescent tubes for each aquarium.

None of the currently available high-tech gear is utilised at all. They believe the use of good quality living rock is the answer to maintaining water conditions good enough to induce spawning, and the use of protein skimmers or other types of chemical filtration seems to be taboo.

There are now commercial breeding systems for reef organisms available in the United States, and these are based on the use of living rock, with the only filtration being specially designed and patented algae filters. In fact, for some years now, research has been carried out with systems where no filtration whatsoever is used.

Aquarists needed

It is obvious that the technology is available for the successful spawning and rearing of quite a large number of reef species, and the same techniques will undoubtedly be good for many more.

All that is really required now are aquarists with the will to utilise these techniques and expand on them. Hopefully, one day, we will see the same level of success which is enjoyed by freshwater aquarists. **MAP**

At least one species of Porcupine Puffer (this is *Diodon hystrix*) features in the extensive list of notable successes.

Kits and manuals are now available to help aquarists culture rotifers and algae successfully. In the UK, these kits are distributed by Underworld Products.

FURTHER INFORMATION

The ***International Marine Aquarists Association (IMAA)*** is dedicated to the advancement of the marine fishkeeping hobby, particularly with regard to captive breeding, and to the conservation of natural habitats.

Annual membership is £15.00 in the UK and Eire, and £24.00 for all other countries (payment accepted in Pounds Sterling only).

If you wish to join, or require further information, please write to the ***Membership Officer, International Marine Aquarists Association, Freepost (BS7498), P.O. Box 7, Ilminster, Somerset, TA19 9BR, England*** (no stamp required if posted in the United Kingdom). A stamped addressed envelope would be appreciated.

WATER'S EDGE

BY DICK MILLS

STEPHENS (PLASTICS) LTD

New planting baskets

Using coconut fibres, COCO-FLEX PLANT BASKETS are quite safe environmentally from many standpoints: they won't pollute the atmosphere (during production), nor the pond water during use; they are soft enough not to puncture liners, yet delicate enough for plant roots to penetrate.

The baskets can be adjusted and, should water levels fall below 'shelf level', the baskets act as natural moisture-retainers for long periods. Not confined to pond use, Cocoflex planting baskets can be employed elsewhere in the garden and for floral displays too.

Details from: **STEPHENS (PLASTICS) LTD., Hawthorn Works, Corsham, Wilts SN13 9RD. Tel: 0225 810324/5/6; Fax: 0225 811390.**

[redacted]

Koi pools by post

Designing a Koi pond from the armchair is one thing, but receiving a complete Koi pool set-up by Mail Order takes the imagination just a little ... but it's about to happen.

The new, easy-to-install Koi pond package, from **CATERHAM KOI**, can now be delivered to your door anywhere in mainland Britain. The round, pre-formed pond (in black, red, blue, white or green) is 9 feet (approx 3 metres) in diameter with a 4ft (1.3m) depth and comes with or without a bottom drain; add to this a three chamber filter, pump, flexible hoses (clear or black), plugs, circuit-breaker, adaptor and venturi and you've got the makings. All you supply is the hard work digging the hole!

Details from: **CATERHAM KOI. Tel: 0883 741804.**

[redacted]

Feeding and fixing

Floating foods are, by definition, light in weight, and many people may feel that they are buying a lot of air at times, but the new POND PRIDE FLOATING FOOD STICK from **KING BRITISH** will certainly give them value for money; it has up to twice the weight per litre of comparable items, while remaining at the same price! Although aimed at the Koi market, the Sticks will be accepted just as readily by all pond fish.

Still with foods, KB reports that the trade has gone 'potty over plastic' — a reaction the company's latest policy of marketing fish foods (flake and specialised foods) in easier-to-label (and stack) plastic containers. Eye-catching on the shelves, apparently once 'off the shelf', customers find the new foil tops easier to deal with, too.

Repairing a leaking pond is something everyone hopes won't happen to them — all that draining down and refilling, never mind where to put everything in the meantime! JUST FIX IT, again from Pond Pride, solves the problem almost instantly. The two-element materials work under water (so, no draining down) and will not just mend holes in liners or cracks in concrete, but can also be used to seal pipes and pump joints.

Details from: **KING BRITISH AQUATICS LTD., Haycliffe Lane, Bradford BD5 9ET. Tel: 0274 573551; Fax: 0274 521245.**

[redacted]

New filter medium

Even though you might not be needing to process anywhere near 10 million gallons of fish farm effluent per day, it's reassuring to know that the same filter medium that **CYPRIO** developed for that very purpose can be used just as effectively in your pond.

The new HYPERPAK filter medium is, because of its slightly more cylindrical shape, even more effective for biological filtration than its tear-drop shaped predecessor CYPRIPAK. Both of these 'open design' media — it is claimed — offer advantages over conventional tube media, as there are many more 'entry windows' through which polluted water can flow freely.

Because Hyperpak combines the effectiveness of Cypripak with small size, it is particularly suitable where space is limited and is, consequently, used as standard in Cyprio's compact GREEN MACHINE 1500 and 2500 FILTERS. Hyperpak Filter Medium is available in 1,000, 100 and 25 litre sizes.

Details available from: **CYPRIO LIMITED, Eastgate Mews, 131/133 Eastgate, Deeping St James, Peterborough PE6 8RB. Tel: 0778 344502; Fax: 0778 348093.**

[redacted]

No more green water

TROPICAL MARINE CENTRE

The green water season will be upon us any time now, but a new range of three very neat POND CLEAR ULTRA-VIOLET WATER CLEANSERS launched by the **TROPICAL MARINE CENTRE** will combat anything those green microscopic 'aliens' can do to spoil a pond's appearance.

When used in conjunction with the pond's filtration system, any suspended algae in the water are killed and coagulate together for effective removal by the filter medium. An innovative feature is that the 'glow' from the lamp (housed in a sturdy protective cover) can be seen through the translucent hosetails, indicating that all is operating correctly.

The three models are in 8, 15, and 25-watt sizes and a combination of sizes can be selected to suit any pond. The slim-line units are unobtrusive and are easily concealed near to the pond.

Details from: **TROPICAL MARINE CENTRE LTD., Solesbridge Lane, Chorleywood, Hertfordshire WD3 5SX. Tel: 0923 284151; Fax: 0923 285840.**

CYPRIO LTD.

[redacted]

New name

Despite all the 'new technology', there are those that feel that water can be just too pure to support aquatic life. With this in mind, it is interesting to note **KENT MARINE**, a new name to look out for.

They have developed R/O RIGHT, a specially-formulated supplement to add to water treated by Reverse Osmosis and/or De-ionisation treatments, re-seeding it with the necessary trace elements on which aquatic life so obviously depends.

Similar water treatments include SUPERBUFFER-dKH (to adjust and stabilise pH levels in marine systems); ORGANICS ADSORPTION RESIN (removes organic pollutants better than carbon — and can be re-charged when a yellowing indicates need for re-generation); A F CICHLID CHEMISTRY (simulates Rift Valley water and is used in conjunction with A F CICHLID BUFFER and A F CICHLID TRACE ELEMENTS supplement).

The foregoing are in powder form (all coincidentally, pure white in colour), but liquid supplements are also available for other purposes: ZOE (pronounced zoay) comes in two formulations — one for freshwater, one for marine — and both contain *Spirulina* and kelp for fishes' nutritional needs, in addition to vital vitamins and minerals. DISCUS TRACE ELEMENTS and FRESHWATER PLANT supplements are self-explanatory.

CONCENTRATED LIQUID CALCIUM is the thing to add to your reef system to assist development of corals, invertebrate life and calcareous algae.

None of Kent Marine products contain nitrates, phosphates or any other fertilisers which could cause rampant algal growth!

Full details of all Kent Marine products from: **ADVANCED AQUARIUM PRODUCTS, 10 Crundale Way, Cliftonville, Margate, Kent CT9 3YH.**

OFI's unite to save industry

As regular readers of **Trade Talk** will know, **Ornamental Fish Industry (UK)** has made huge strides over the past couple of years, not just in improving standards and liaising with all the relevant authorities whose decisions have a direct impact on the aquatic industry itself, but also in actually influencing legislation.

As a direct consequence, some major 'commonsense' decisions have been taken which have produced significant progress all-round. The results of all this hard work nearly went out the window in mid-March, though, when news came through (with only two days to spare!) that a meeting was to be held at the Directorate-Generale in Brussels, during which two proposals, both of which would have had disastrous effects on the aquatic industry, were to be discussed.

At worst, one of these proposals — if decided upon — could have resulted in the banning of Koi imports into the UK (as a zone free from Spring Viraemia of Carp-SVC) from third countries, including Japan and Israel, for up to two years! The other proposal, if adopted, would have required *every* shipment into *every* EU country, from *every* exporter, in *every* country in the world, to be examined by health officials *on the day of loading*, prior to any health certificates being issued.

It must be stressed that these proposals did not come from our own ministry (MAFF), but from Brussels itself. In fact, it was our ministry — who are in regular contact with OFI (UK) chief executive **Keith Davenport** — who alerted him to the actual timing of the meeting.

Following urgent discussions between OFI (UK) and MAFF, an approach was made to **Ornamental Fish International (OFI)** to inform this organisation of the imminent threat. The OFI reaction was immediate, with a fax going out to all its European members on the same day.

By first thing next morning, vigorous representations were already being made by OFI members to trade organisations and ministries within the EU, and this, allied to direct faxes from OFI (UK) and OFI to the chairman of the meeting itself ... plus more than a little help from MAFF, paid off.

As a result, the dreaded decisions have been deferred. In their place, other recommendations which allow the continuation of Koi imports into the UK and do away with the proposed certification needs for shipments, have been agreed.

So, at least for the time being, the industry can breathe again ... until the next crisis strikes with little or no warning. Watch this space!!!

Chinese marketing set to improve quality

All of Northern China's premier Goldfish farmers have grouped together to market their best Goldfish under the collective name of **'Nor-Chin'**.

According to Star Fisheries' **Mick McNulty,** on behalf of the **Northern China Goldfish Breeders Co-operative,** the 'Nor-Chin' name will enable customers to be sure that they are buying the best quality. Mick told **News Desk:** "They are following in the footsteps of other countries, such as Ireland, who sell their best butter under 'Kerry Gold', New Zealand with 'Anchor', and Denmark with 'Danish'. Now, customers can buy another product, Goldfish, with confidence and faith."

Star Fisheries have also issued a guarantee that all of their Fancy Goldfish imported from Northern China will be free of ulcers.

Explained **Tam Meechan,** marketing manager: "Ulceration is the largest fish health problem today. Over the years, thousands of pounds worth of fish have been lost by aquatic retailers to this almost untreatable disease.

"Ulcers caused by *Aeromonas salmonicida* are a particular problem. Often, the bacteria infect the fish during the breeding and rearing processes, only to break out months later because of stress."

He concluded: "Ruthlessly rejecting sub-standard stock is the only way forward. The public wants better value for money and it is the responsibility of wholesalers to provide retailers with the support they desperately need. By offering this guarantee, we are leading the field for the rest of the ornamental fish industry."

For details, contact **Mick McNulty or Tam Meechan, Star Fisheries, 94A Benhill Road, Sutton, Surrey SM1 3RX. Tel: 081 643 8162/5; Fax: 081 643 8166.**

New Mag Noy offices

Guests — including *A&P's* 'Coldwater Jotter' **Stephen Smith** — and associates of Israel ornamental fish producers **Mag Noy** (well-known to all UK Koi and Goldfish importers) attend the celebration opening of purpose-designd offices at the company's headquarters at Hazorea, Israel, recently.

Efraim Shapira, of Kibbutz Hazorea, cuts the ceremonial ribbon at the opening of new offices at Mag Noy, Israel.

The company is a collective of five kibbutzim situated across the northern half of Israel, where a range of coldwater fish (including Koi and Fancy Goldfish), as well as aquatic plants, are produced for export.

Speaking at the opening, **Oded Cohen,** marketing director of Mag Noy, praised the efforts of all involved in the success of the company remarking, "We hope that this co-operation will help to spread our business throughout the world."

[*Stephen Smith's illustrated feature on his Israeli trip will be published in A&P in a few month's time.* **Ed**]

Cyprio into America

Pond filtration specialists **Cyprio** have restructured their sales force, to provide "an improved service to wholesale and retail sectors of the water gardening market," according to the company.

Sales and marketing manager **Steve Phillips** heads a team of three sales executives and a sales co-ordinator, who cover the whole of mainland UK.

Cyprio has also opened an office and warehouse in Des Moines, Iowa USA, to provide a service to markets in the USA and Canada.

Malcolm Goodson, managing director of Cyprio, remarked, "We have carried out a good deal of research in the USA market and feel that the time is right to expand our operaton in this area."

Cyprio Limited, Eastgate Mews, 131-133 Eastgate, Deeping St James, Peterborough PE6 8RB. Tel: 0778 344503; Fax: 0778 348093.

Cyprio USA, 2507 East 21st Street, Des Moines, Iowa 50317, USA. Tel: 515 264-9933.

SOCIETY WORLD

R & R Committee elected

The main committee members of **Reigate and Redhill District AS** elected at the society's AGM are as follows: Chairman: Sid Fewtrell (Tel: 0293 786078); Secretary: Ivor Stemp (Tel: 0293 783249); Treasurer: Dick Gush (Tel: 0737 765152); PRO: Jeremy Spence (Tel: 0293 512932).

TV Cats Calendar

Thames Valley Catfish Area Group meetings for the remainder of 1994 are as follows:

11-12 June: Group Meeting — Amersham Community Centre. Speakers (2pm): The Catfish of **Trevor Morris** (CAGB Northern Area Group); a fish house for Corydoras by **Alan Sykes**.

17 June: TV Cats Open Show AofA Superbowl round, at Amersham Community Centre.

4 September: Group meeting — Amersham Community Centre (also open to non-members). Speaker (2pm): **Jim Carney** (FBAS) on showing Catfish. Catfish at the European Aquatic Fair.

4 December: Group meeting — Amersham Community Centre. Speaker (2pm) and auction of fish and equipment, plus TV Cats video show (members show catfish on the move, through the eyes of their video cameras).

Details from **Steven Halliwell,** 'Rivendale', Constables Croft, Arncott, nr Bicester, Oxon. Tel: 0869 248340.

New Aberdare officers

Aberdare Aquarists' Society officers for 1994 have been elected as follows: Secretary: Allan Jones; Chairman: Roger Roberts; Show Secretary: Brian Rees; Assistant Show Secretary: Philip Price; Minutes Secretary and Trophy Officer: Philip Price.

LAKESIDE '94 CANCELLED
We have just received news that, owing to security reasons regarding the safety of some of the speakers at the event, **Lakeside '94** scheduled for **27-30 May** — has been cancelled.

DIARY DATES

MAY
Sunday 1
Swindon AS — Open Show, Town Hall, Cricklade, Nr Swindon, Wilts. Details: **Mrs K. Morris.** Tel: 0793 51077; or **Mrs Q. Curtis.** Tel: 0793 532920.
Sunday 8
Gateshead AS — Open Show, Carrhill School, Gateshead. Details: **Tom Gray,** Show Manager. Tel: 091-286 4215.
Ilford and DAS — Third Annual Convention, Sir James Hawkey Hall, Broadmead Road, Woodford Green, Essex, 11.30am-6pm. Speakers: **Mary Bailey** (African Cichlids) and **Philip Swindells** (Improving your pond). Sponsored by **Sebray** and run in association with **FBAS** and **Aquarian.** Further information and tickets: 081 529 7173, 0708 748946, 081 550 1252.
Huddersfield Tropical Fish Society — Open Show, Rawthorpe High School, Nether Hall Ave, Rawthorpe, Huddersfield. Benching: 12 noon-1.45pm. Auction: 1.30pm. Details: **David Graydon,** 36 Long Lane, Dalton, Huddersfield HD5 9LB.
Sunday 15
Northern Area Catfish Group — Free lectures, displays and catfish information. Cascade Water Gardens, Radcliffe, Nr Manchester. Details: **Bill Hurst,** Secretary, Tel: 0704 213690.
Sunday 22
Eastleigh and District AS — Open Show, Pirelli General Sports & Social Club, Dew Lane, Eastleigh, Hants. Details and schedules: **A. I. Stevens,** 256 Market Street, Eastleigh, Hants SO5 5QB. Tel: 0703 617477.
Rothwell and Wakefield AS — Open Show and auction, Blackburn Hall, Marsh Street, Rothwell, nr. Leeds. Details: **K. Swinson,** Secretary, 56 Park Avenue, Allerton Bywater, Castleford, W. Yorks WF10 2AS. Tel: 0977 511464.
Washington AS and Pondkeepers — Auction, Springwell Village Hall, Springwell, Gateshead. Refreshments and licensed bar. Details: **Michelle.** Tel: 091 416 7292.
Sunday 29
Skelmersdale & District AS — Annual Open Show, Skelmersdale Labour Club, Westgate, Old Skelmersdale, Merseyside. Booking in: 10am-12 noon. Details: **John Barlow,** Club Secretary, 119 Rectory Road, North Ashton-in-Makerfield, Merseyside WN4 0QF. Tel: **John Barlow,** 0942 716191; or **Garry Lester,** 0695 25734.

JUNE
Sunday 5
Erith and District AS — First Open Show, Lamorbey Labour Hall, Wellington Avenue, Sidcup, Kent. Information: **Andrew Wood,** 53 Shirley Avenue, Bexley, Kent DA5 3AY. Tel: 081-304 6426.
Stockton-on-Tees AS — Open Show and auction, Masonic Hall, Wellington Street, Stockton-on-Tees. Booking in: 11am. Details: **G. and J. Bell,** 16 Leafield Road, Darlington DL1 5DE.
Sunday 9
Rothwell & Wakefield AS — Mini-show and auction, Carlton WMC, Main St, Carlton, Rothwell, nr Leeds. Booking in: 7.30pm. Details: **Kevin Swinson,** Secretary, 56 Park Avenue, Allerton Bywater, Castleford, Yorkshire WF10 2AS.
Sunday 12
Redcar Fishkeepers Society — 20th Annual Open Show of tropical and coldwater fish, West Redcar School, Kirkleatham Lane, Redcar. Details: **J. Duffill.** Tel: 0642 478836.
Friday 17
Thames Valley Catfish Area Group — Open show A of A Superbowl round, Amersham Community Centre. Details: **Steven Halliwell,** 'Rivendale', Constables Croft, Arncott, nr Bicester, Oxon. Tel: 0869 248340.
Sunday 19
Cannock & District AS — Open Show and auction, Avon Road Community Centre, Cannock. Benching: 10am-12.30pm; Judging: 1pm. Telephone entres: **M. Blackburn,** 0902 344515. Details: **B.P. Smith,** 67 Pye Green Road, Cannock, Staffs WS11 2RY.
Loyne AS — Second Annual Open Show. Details: **Mrs M. Penswick,** Show Secretary, Loyne AS, 6 Slaidburn Drive, Hala Carr, Lancaster, Lancs LA1 4QX. Tel: 0524 388117.
Northern Area Catfish Group — Workshop meeting and lecture on Corydoras, Boys Brigade HQ, Bryn Road, Bryn, Nr. Wigan. Details: **Bill Hurst,** Secretary, 18 Three Pools, Crossens, Southport, Merseyside PR9 8RA. Tel: 0704 213690; or **Trevor Morris,** Chairman, 0924 42386.