AQUARIST & POND KEEPER

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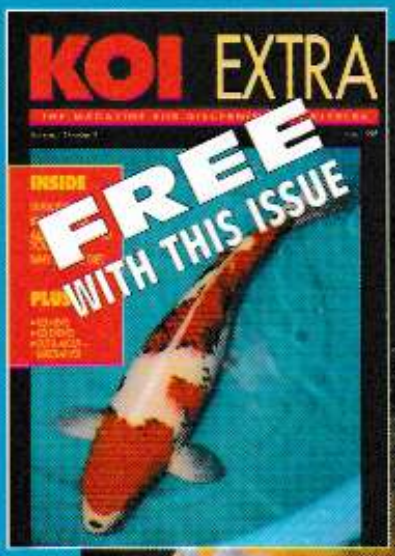

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COVER

MAIN PHOTOGRAPH: *With fish like this around is it any wonder that people are attracted to the hobby? Unfortunately, the Discus is not a fish suitable for the beginner but perhaps something to aspire to as experience is gained. As with all fishes providing the correct conditions for them is paramount to success.*

INSET PHOTOGRAPH: Pond accessories can be functional and fun!

MAIN PHOTOGRAPH: JOHN DAY

INSET PHOTOGRAPH: A&P LIBRARY

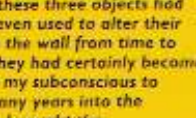
COMMENT

It is a well known fact upon emerging from the shell a baby duckling will bond with the first animal or living creature it sees, which accounts for dogs, cats, sheep and even humans being looked upon as being 'Mum'. What, then, can be the cause of fishkeepers latching on to some species more than others? I'm not talking about a choice made deliberately after, perhaps, many years of trying all the other species and rejecting them, but more along the lines of 'I've always had a soft spot for ...' without knowing the reason why. I have come to the conclusion that it may well be a case of 'imprinting' with us as well as young ducklings.

Recently, following the loss of my father, I had the task of sorting out my parents' home and in amongst all the collection of items gathered over many, many years I suddenly came across the reason for my own personal liking for freshwater Angelfish. Readers of A&P will already have learned of my predilection for these fish (see Famous Faces, A&P, May 1998) but I could not remember ever having made a conscious effort to turn to these fishes — I just knew I liked them. So what was the clue?

Well, if you promise not to spread it around, I had been brainwashed in my younger days by the aquatic equivalent of that then most fashionable of home decoration — the three flying ducks — but in my case the three objects that had been hung on the hall wall throughout my obviously formative years were three Angelfish, all in ascending order both in size and position! Suddenly, I remembered the fascination these three objects had for me — I even used to alter their positions on the wall from time to time — so they had certainly become ingrained in my subconscious to resurface many years into the future when I caught the fishkeeping bug?

What's your excuse?



EDITOR

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John Day gives his own recipe for success

PHOTOGRAPHS BY THE AUTHOR

Discus: My

The variety of fish I prefer to keep and breed are of the true original lines and strains

Solid male Cobalt.

I have been keeping and breeding Discus for over 20 years. When I started I first used stored rain water mixed with my mains supply water but, as time has passed, I felt that this was not suitable due to air pollution such as acid rain, etc, and also because mains tap water may contain undesirable elements for keeping fish. All water supply is now filtered by using a three-pod pre-filter system: First pod, containing a pre-spun wool pre-filter; second pod contains a 10 micron carbon block cartridge; third pod contains a carbon and resin block, heavy-metal removing cartridge.

I have tried using a reverse osmosis system with TFC membranes operating in series to obtain my water (which is a very good method) but I felt that over a period of time, with 90 per cent water rejection being wasted as a membrane has no way of separating beneficial salts and minerals within the water supply, that this wastage was unacceptable. I now use (and have done in recent years) a two-column ion exchange de-ioniser (re-chargeable type, using cations and anion resins); I only use 30 per cent pure hydrochloric acid to recharge my cation resin and only Sodium Hydroxide (pearl grade) to recharge my Anion resin. This I find most suitable for my needs. Obviously, I am very aware of the hazards that are involved for other fishkeepers when using acids and salts for recharging the de-ioniser.

Most of my tanks are on a centralised system and are of a 'clinical' set-up with bogwood and artificial plants as decoration. My other tanks, which are not on the system, are used for quarantine and breeding purposes. I now use linked into my centralised system a canister which contains a nitrate-removing resin which I have found to be extremely beneficial for removing excessive nitrates and phosphates within the water.

Way

Basic diet

The basic diet I use for my fish is a Beef Heart mixture which contains spinach, wheatgerm, cichlid flake, multi-vitamin supplement, dried baby milk mixed with natural gelatine. Also frozen foods such as Bloodworm, Glassworm and Black Mosquito larvae. I often feed finely-chopped raw spinach and freeze-dried Tubifex, cichlid flake and cichlid granules. The live food I occasionally feed are Whiteworm and chopped earthworms.

Any new fish I acquire undergo a precautionary treatment as follows: A bare tank is filled with the prepared water to which only an air-operated sponge filter, airstone and heater/thermostat unit is added. The fish are allowed a two day settling down period to acclimatise to their new environment. I then raise the temperature to 90°F and, gradually, over a period of two days, add five tablespoonfuls of iodine-free rock salt to my 20 gallon quarantine tank until a conductivity reading of 2000 S is reached; from then on I carry out daily 15 per cent water changes, siphoning any debris out from the base of the tank and replacing the 15 per cent water with the addition of the necessary salt content. This I continue for the next ten days at which point large water changes (30-40 per cent) are made to remove the salt. I use this same method for most of the other Discus ailments I have encountered and I feel it has been the most successful to date.

During my many visits to top Discus breeders in Europe I, like them, am of the opinion that using drugs for the eradication of skin and gill flukes and intestinal nematodes can cause severe damage to the internal organs, especially the swim-bladder, which can cause the fish to 'head-stand.'

All Discus carry nematodes of one kind or another within their digestive tract, so unless a clear distinction can be made by a vet as to which type are parasitic, the hobbyists would be well advised to leave drugs alone.

The variety of fish I prefer to keep and breed are of the true original lines and strains.

Dislikes

1. Vast importations of colour-enhanced (by hormonal treatment) fish. Invariably, the colours of these fishes are very short-lived, they rarely grow, they are usually sterile and are susceptible to disease.

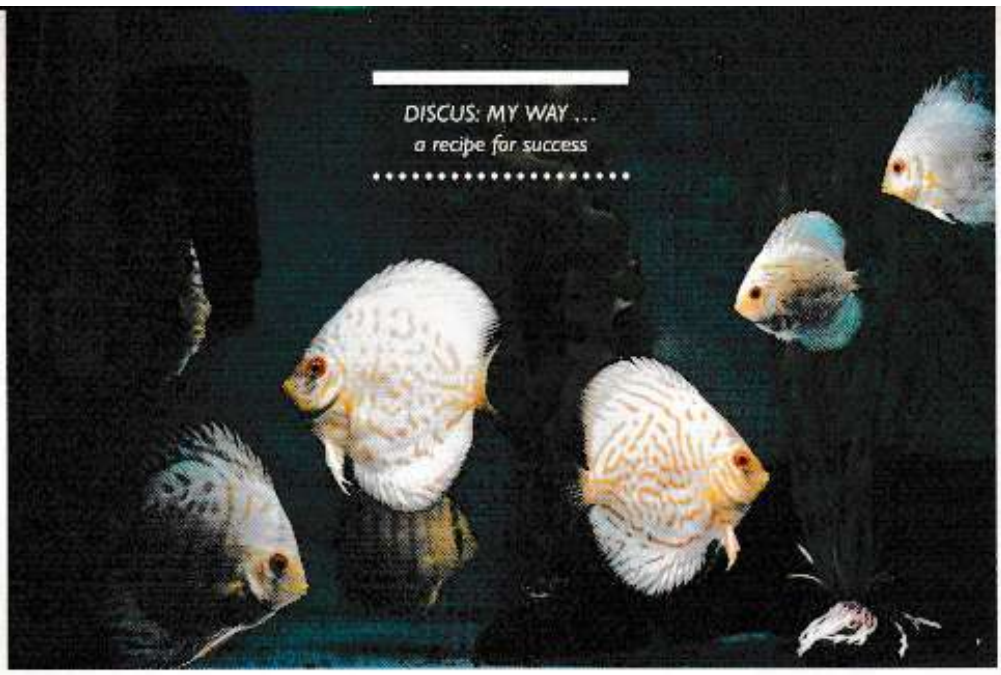
2. Breeders using hormones to induce spawning.

3. For many years I have felt that

Wild caught Red Alenquer.

DISCUS: MY WAY ...

a recipe for success



A group of young Turquoise and Blue Diamonds with a F.1. Xingu in the background.

Wild pair of Tefe Greens.

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the quantity of fishes available to the hobbyist in this country has been of poor quality.

The majority of true Discus strains do not show their full colours at 12 in because they are too busy putting on growth rather than colour in adolescence, so the hobbyist should be wary when seeing full-colour fishes at this size. Many other breeders, like myself, have the same views and opinions. It is, therefore, important that breeders avoid inbreeding and not only breed for colour but also for size and shape to be maintained into future stock. At the end of the day we do not want Discus looking like some of some other fancy varieties. Good quality Discus are now being bred in this country and the future looks very promising for the fishkeeper. The attention to quality and purity of strains is paramount. After all the Discus is truly the King of the Aquarium and must be able to deserve the title.

Dave Garratt looks at the changing faces of marine fish

PHOTOGRAPHS BY A&P LIBRARY

Stock Rotation

The Regal Angel, *Pygoplites diacanthus*.

I left behind the once dreaded age barrier of 40 quite a few years ago and find myself hurtling towards the next milestone of 50. Therefore, whilst I may be getting old I have plenty of years on which I can reflect upon the changes within the hobby.

One aspect of these reflections that strikes me is the differing fish seen in the retail market. Some species have waned or gained in popularity whilst others are rarely seen.

The supply of marine fish may be affected by environmentalist pressure, political instability, natural disasters, collection and transportation methods. Recession and the cost of livestock will also influence buying patterns as will customer preferences such as the recent upsurge in reef systems.

Perhaps as committed aquarists, we have been influenced by the upsurge of the environmental movement and are now more discerning and will no longer purchase fish we know to have little chance of survival in captivity.

> One aspect of reflecting back over the years is the differing fish seen in the retail market

Changes in taste

When I first began keeping marines 'big and bold' ruled the roost. Fish were frequently available as large adults, a few that spring to mind include Groupers and Snappers such as the Polka-dot or Panther grouper (*Chromileptis altivelis*), Powder Blue Grouper (*Epinephelus flavocaeruleus*), Coral Trout Grouper (*Cephalopholis miniatus*) and the Emperor Snapper (*Lutjanus sebae*). Today these large predatory adults are not seen anywhere near as regularly.

Another regular import were large adult Angels, not a wise choice in view of how notoriously difficult they can be to settle into captivity. Today there are many smaller Angels available and these smaller sizes far outnumber the adult sizes.

Environmental pressures

I can introduce environmental issues through a group of fish that

are rarely seen for sale, Angels of the genus Chaetodontoplus, species of which include *C. conspicillatus*, *C. septentionalis* and *C. duboulayi*. These fish, whilst being spectacularly beautiful, are exceptionally difficult to keep in captivity. Certainly some wholesalers make a point of not importing Angels or Butterflyfish that are known to feed almost exclusively on coral polyps and are, therefore, virtually impossible to keep in captivity.

Seven or eight years ago the marine hobby was under severe pressure from a whole range of environmentalists. Accusations that the hobby stripped the reefs were common. Today the emphasis has moved from confrontation to communication. This communication between environmentalists and reputably importers has seen collection facilities set up to provide a sustainable industry and income for local economies.

Location

Deep water fish will obviously be more difficult to obtain thereby commanding a high price should they find their way to the dealers tank. The Pine Cone Fish (*Monocentrus japonicus*) fits the bill. It is found in deep water in the Indo-Pacific where its light generating organs are probably used to attract prey.

Being such a rarity little is known as to its needs or what would provide a balanced aquarium diet. Deep water fish have a reputation for not adjusting to captivity and they may suffer if the temperature climbs above 75°C.

Few marine fish that are seen within the hobby could be really classed as rare, a point that can be illustrated with the Flame Angel (*Centropyge loriculus*). It is abundant in its natural location but this location is remote, collection is difficult and transportation costs high, leading to a high retail price, therefore only small numbers will be imported thus giving an appearance of scarcity.

STOCK ROTATION ... changing faces of marine fish

Political influences

Fish from one particular geographical location have never been prevalent within the hobby. When this location does provide the goods they are superb and command a high price. I refer to the Red Sea whose species seem to outshine their sometimes identical cousins from other waters. Species I have in mind include the Majestic Surgeon (*Acanthurus sohal*), Purple Tang (*Zebrasoma xanthurum*), Addis Butterfly (*Chaetodon semilarvatus*) and Regal Angel (*Pygoplites diacanthus*).

The Red Sea demonstrates how political changes can be reflected in the fish you see for sale. Twenty years ago fish from the Red Sea were scarce in the UK.

Problems of increasing unrest eventually led to the virtual demise of Red Sea imports to the UK during the late 1980s. Politics move on and access is now much easier allowing for a flooding of the Asian market and a subsequent fall in prices by as much as 50 per cent over three to four years.

Changing collecting patterns

When I took my first steps in marine fishkeeping, during the mid 1970s, Clown Triggers were only available as large adult specimens. They were generally 8-10in with a massive price tag to match (£150 at 1977 prices). Adult Clown Triggers are shallow water fish and in the early 1980s someone must have hit on the location and seasonal aspect of the availability of juvenile.

Commonsense suggests many

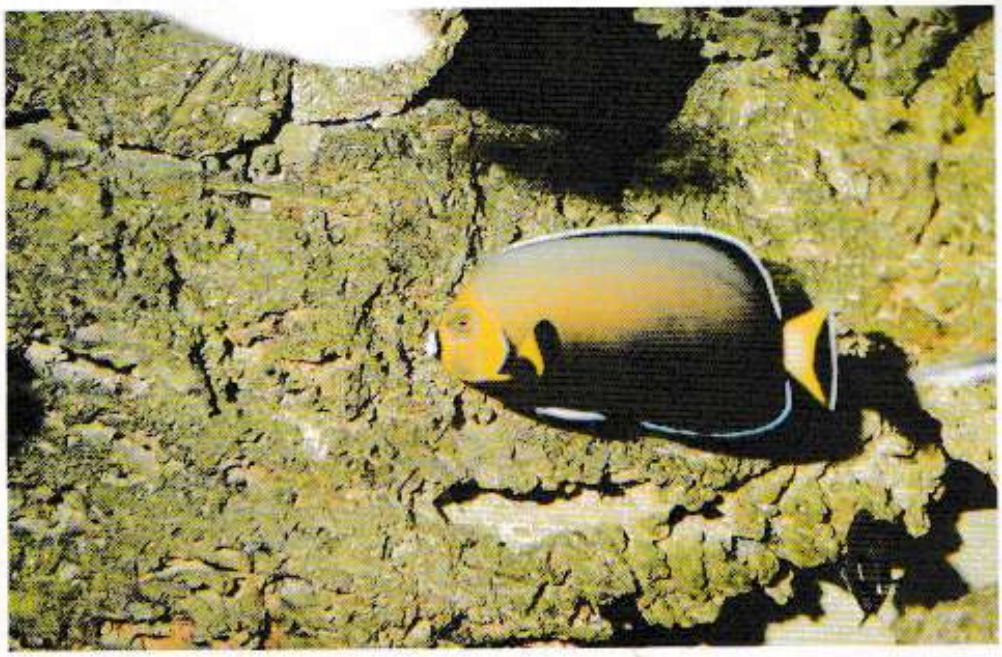
The High Hat, Equetus acuminatus.

small juveniles present easier collecting and transportation logistics, and ultimately better profits, than a few adult specimens. Today, the smaller Clown Trigger generally prevails, on a seasonal basis, and offers the aquarist the fascination of rearing this beautiful fish through its colour changes as it matures.

Economics

Many retailers will tell you that the hobby is now static and may never again reach the success of earlier years. Market forces have increasingly come into play allowing price to bestow a rarity value to a fish, particularly so in a genus where cheaper members are commonly available.

The False Gramma (Pseudochromis paccagnellae) and the Strawberry Gramma (P. porhyreus) are striking fish that are available for a few pounds. However, other Pseudochromids such as flavrentor and dutoiti are only occasionally imported and, therefore, command a



The Angelfish, Chaetodonplus conspicillatus.

The Emperor Snapper, Lutjanus sebae.

high price, prompting the question as to whether an aquarist would be willing to meet such a price in the face of cheaper competition from equally attractive species.

Recently the Emperor Cardinal seems more common, but three or four times the price than the Pyjama Cardinal. If the customer will not meet this price then the retailer will be reluctant to stock the species and the wholesaler may well stop importing them.

Customer preference

Cost is not always the final factor of customer preference as even cheap, common fish such as Damsels will have members that are rarely seen for sale. The Neon Damsel (*Abudefduf oxyodon*) is a very striking species often available as small specimens, but the colour fades with age and the fish becomes viciously aggressive. This makes it an unattractive proposition when compared against other damsels. I know of a retailer who has been trying unsuccessfully for a number of months to give away, free of charge, a 3in Neon Damsel.

Other fish have characteristics that ensure they will never become popular within the hobby. Perhaps just the odd one will occasionally be

STOCK ROTATION ... changing faces of marine fish

purchased for its novelty value. I refer to those voracious predators known variously as Frogfishes, Anglerfish or Toadfish (*Antennarius* species).

Not many of us would generally want to provide a home for a fish that spends most of its day motionless, waiting for the next meal to swim by. The choice of tank mates would be somewhat restricted as these fish can swallow prey well over half their own size.

Some fish are so dangerous as to render them unsuitable for the home aquaria. Most importers would not entertain the Stonefish (Synanceja), a genus whose sting can be fatal to humans.

Certain fish that do not possess unpleasant characteristics also fail to establish a place within the hobby. How many of your friends or fellow club members have actually kept Tasselled Filefish (*Chaetoderma penicilligerus*), High Hat (*Equetus acuminatus*), Jackknifefish (*Equetus lanceolatus*) and fish of the Hamlet (*Hypoplectrus*) and Badgerfish (*Siganus*) genera?

Genuinely rare fish?

Sometimes there occurs a similar, but distinct, species to the one commonly seen within the hobby. For example, the Yellow Long Nose Butterfly (*Forcipiger flavissimus*). Very few people have seen its very similar and even longer-nosed cousin, *F. longirostris*. An Australian Copper Band, with the striped effect only on the front of the body, can also been found, but only as a rarity (the only one I have ever seen was in a friend's tank). This same friend also had an unusual Pufferfish. They have kept many Puffers including species with known colour variations but, except in their tank, I have never seen a velvety deep blue Puffer.

Are these fish rare or has one of the topics I have covered managed to keep them from our tanks? Perhaps someone can fill in the gaps and tell me why these fish are so rarely seen. I will leave you to wonder where the hobby will go and what we will be keeping in our tanks over the next 25.

I am greatly indebted to Derek Thompson of the Tropic Marine Centre for the advice and time he so generously gave to help me with the writing of this article.

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Dr David Ford says concrete ponds are prone to leakages, especially after winter frosts

PHOTOGRAPHS BY THE AUTHOR

The Slow Leaking Pond

A step by step guide to easily solve the problem

Concrete is certainly the best medium for the complex designed pond, especially where linked by waterfalls and capped by decorative walls. However, it is the most susceptible material for springing leaks. The concrete shell can settle, crack under the strain of ice pressure or just 'move' as the garden changes shape over the years.

Under the waterproofing layer of polypaint sealer the subsequent cracks in the rendering will open and close with daily temperature changes ... only microscopic mounts but enough to stretch the sealer until it fails. The nearest pinhole, let alone a rear, will allow water to ingress and from then on it's downhill all the way to a leaking pond.

Detective work

If, like my set-up, you have a multi-pond system, the only noticeable effect is a lowering of the water table in all ponds. So, switch off the pumps long enough (may take a few days) to check which pond is the leaker. Any fish therein can be moved to a non-leaking pond.

The problem pond is left until the water level no longer falls (assuming no heavy downpours of rain). This means the leak will be at that water level. Drain and inspect. Probing the meniscus ring around the pond with a chisel will soon show where the leak has occurred, because the concrete will be soft and crumbly through water damage. Any tears or holes larger than pin-pricks will be seen too, since the area will tend to turn white from water damage.

If the walls are heavily coated

RIGHT Close-up of the area showing a crack in the polypaint seal being chopped open.

FAR RIGHT The rapid setting cement is liberally applied to the dug out section, then smoothed off and left to set and dry.

with algae paint with a 50/50 mix of warm tapwater and domestic bleach using a sweeping brush with plastic bristles. Allow to soak a few hours and then wash down.

Take all the usual precautions — warm bleach is corrosive and must not splash onto clothes or skin, nor the wash-down water escape into any other pond.

Using a hammer and chisel chop into the damaged area and dig out all the soft concrete, cutting back into a good, solid concrete. Chop away any polypaint beyond this area too and then scrub well with a wire brush.

Use a rapid setting cement from DIY stores — they all sell ready mixed polythene bags of this cement (about 2.5 kilograms for £2). Remember that this material really is rapid setting. You only have 10 minutes to work the wetted mix and it is solid within the hour. Mix small amounts at a time, pressing it into the cut-out area and smoothing it off with a wet trowel.

The repaired pond is restored to its former glory, home to prize Koi!

Waterproofing

After 24 hours the first of two, preferably three, coats of waterproofing paint (such as Aquaseal 40 or Sealer G4) can be spread over the area. I have used water-based polypaints in the past with some problems of subsequent peeling where the new paint layer meets the old. This did not cause new leaks, but the paint flakes can break loose and get into the pond with the fish — being prize Koi you don't want them inspecting such detritus!

Hence, this time I used a solvent-based paint. The choice was the black bitumen paint used for water cisterns such as Aquaseal Protective Black Bitumen Paint (litre tins available at any DIY store).

It is essential that solvent paint is used on a dry surface, which is difficult in the saturated air within a drained pond. Hence the area to be painted is pre-heated with a domestic hair dryer.

Obviously using a hairdryer outdoors (let alone standing in a damp pond) is dangerous. So do use an extension lead fitted with an RCD cutout and be very careful not to drop the dryer; do disconnect it from the mains if laid to one side.

Subsequent layers, each a day later, do not need the preheating. After the paint has set rubbery but solid fill the pond with spray-washing down of the painted area and drain again to remove any residual solvent.

All this may seem a lot of trouble for a tiny leak but it really is a case of a stitch in time saves nine!

FOCUS ON
FISH
HEALTH

A Policy of Prevention

Roy Osmint gives guidance in avoiding problems in advance

PART 2: The Fish

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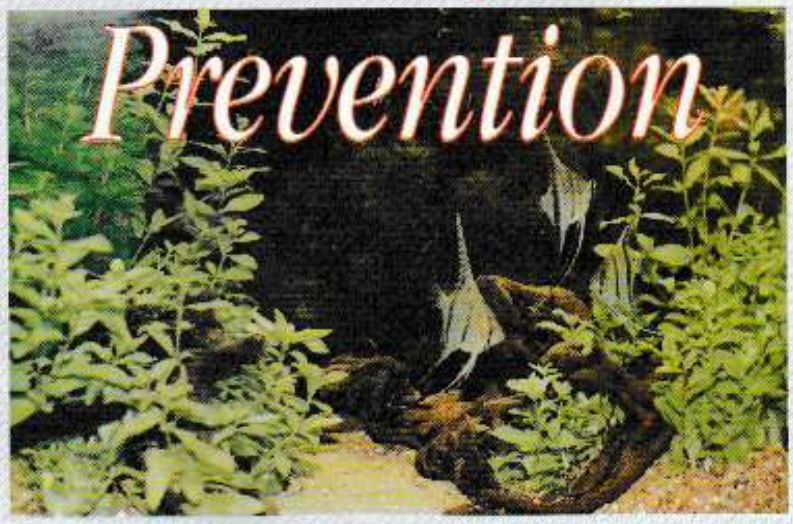

▲ A completely 'balanced' aquatic scene with healthy fish and thriving plants.

To remain in good health fishes, like any other animal, must, in addition to living in a favourable environment have ready access to adequate quantities of appropriate foodstuff.

Many common fish diseases in the aquarium can be triggered by factors directly attributable to dietary deficiency in one form or another as a consequence of unsatisfactory husbandry on the part of the aquarist. Not, I hasten to add, in most cases through neglect, but simply from a lack of appreciation or understanding of the fish's basic needs.

Let us consider an average tropical aquarium housing a selection of popular community species. Here we are likely to find an assortment of fishes the origins of which will probably spread across the globe from a diverse range of habitats. Some will be fast swimmers, others more leisurely.

Top feeders, bottom feeders and middle distance fish will probably be represented along with perhaps species of nocturnal habit or with specific dietary requirements such as herbivores or carnivores.

We must take steps to ensure that the dietary needs of all members of the community are met, not just the strongest or fastest. For example, a well balanced, nutritious flake food scattered on the water surface may be fine for fast-swimming top feeders, but slower-moving varieties or those designed for feeding from the bottom are likely to lose out unless special arrangements are made for them.

Species such as Catfishes and Loaches are often categorised as 'Scavengers', but this does not mean they can remain in good health on the leftovers of others alone. We must ensure that adequate quantities of the right kind of food get down to their feeding level. There are also many proprietary brands of food specifically-designed and prepared for fishes of all habit readily-available from stockists.

By actively taking steps to always ensure that individual fish receive a properly-balanced and appropriate diet and thus retain a high resistance to disease we automatically help protect the whole community and fulfil a further important function in our overall disease prevention policy.

Pathogenic Organisms

It is almost certainly true to say that all aquaria, no matter how well maintained, will carry a range of pathogenic organisms. These potentially-dangerous, disease-causing agents are as much a part of the

FOCUS ON

FISH HEALTH

A Policy of Prevention

aquatic environment as they are our own and form part of nature's delicate balance. Provided that this equilibrium is maintained all should be well; it is only when the balance becomes tipped in favour of the pathogens through reasons such as those described earlier that disease is likely to gain a hold.

Three principal types of pathogenic organisms exist — viruses, bacteria and parasites — and although very different all are capable of causing major problems. Details of some of the countless forms and their effects can be found in any good fishkeeping textbook as highlighted in the opening paragraphs of Part 1 of this article (see Fish Diseases — A Policy of Prevention, Part 1, *A&P*, May 1998).

Broadly speaking, viruses are sub-microscopic entities which consist of a single nucleic acid within a protein envelope. Upon encountering a suitable living organism, which is essential in order for the virus to replicate, it commences to corrupt the cells of the surrounding tissues. Once a favourable environment is found replication occurs with alarming speed.

Fortunately, from the fishkeeper's point of view, only two or three viral infections occur in aquaria and even these are quite uncommon.

Bacteria can create primary infections by direct assault on healthy tissues as well as frequently attacking tissues that are in some way already damaged. Accurate diagnosis is not always easy as particular bacteria are often capable of producing a number of symptoms.

Parasites are organisms which live in or on others and from which they gain nourishment. This is not, however, in any way a symbiotic relationship as the host does not derive any advantage from the association — quite the opposite in fact! In many ways, by broadest definition, both viruses and bacteria might also be considered parasitic, although in the general context of fish diseases they are not regarded as such.

Quarantine

We must always take great care not to inadvertently introduce active disease into an otherwise balanced and healthy aquarium system. We risk doing so each time a newly-acquired fish is immediately released into the main stock tank.

Although a fish purchased from a reputable source will have undergone a period of quarantine prior to being offered for sale, the actual process of being chased, netted, bagged, transported and released into a strange environment can, in some cases, create sufficient stress to lower resistance and allow disease to gain a hold. If such a fish is then introduced at once into the main aquarium the possibility of infecting the whole community cannot be disregarded.

For this reason another important factor in our disease prevention policy has to be home quarantine. Despite often being seen as an unnecessary expense and nuisance it really does make sound common sense when you think about it, especially when you already have a treasured and well-established collection of healthy fishes to consider. Ideally, therefore, a separate tank should be set up for quarantine purposes into which all newly acquired stock are placed for a period of two or three weeks whilst being observed for signs of any abnormal symptoms. Only when everything appears in order should they be introduced into the main aquarium.

To support this procedure it is important to keep a complete set of utensils, ie, nets, bucket, siphon, etc, for exclusive use in the quarantine tank. Everything must also be thoroughly disinfected after each use.

Conclusion

Regrettably it is not possible for us to create an aquatic environment in which the potential for disease does not exist. Few, if any, experienced aquarists could claim not to have had at least the occasional problem of one kind or another. But there is so much that we can and should do to reduce the chances to a minimum.

By always striving for balanced conditions as well as diligently providing all necessary care and attention to our fishes' needs, both individually and collectively, maximum enjoyment will be derived from the hobby without the requirement to become too intimately familiar with those depressing textbook chapters on fish diseases.

Make any changes to tank conditions gradually, ie, temperature, pH, salinity, hardness, etc.

'Gradually' should be one of the most important words in the fishkeeper's vocabulary.

Other Important Points

- Choose fish with care selecting only those that appear active, alert, in good colour for species, undamaged and with erect fins.
- Do not overstock the aquarium.
- Ensure fishes are likely to be compatible if intended for a community collection.
- Only keep fishes of similar size together.
- Provide adequate cover for timid species.
- Do not keep naturally shoaling species such as Characins in ones and twos, they will not be happy. Purchase a minimum of six.
- Do not overfeed.
- Always equalise water temperatures when carrying out partial water changes or adding new stock.
- Take care not to contaminate water with paint fumes, general household cleaning sprays, etc.
- At night switch on/off aquarium lights considerately so as not to alarm or cause panic.
- Monitor for signs of aggressive behaviour. Rogues can (and do) occur even among normally docile species.

Caught in the Net

Kathy Jinkings continues her cyberspace Lake-trawling

This month we conclude our look at some of the many sites of interest to cichlid keepers.

There can be no better fish to start off with than the Angelfish. This beautiful fish is often the first cichlid that aquarists keep. Anyone thinking of dipping a toe into the water in this way could do far worse than to visit the Angel Book, at **http://members.aol.com/angelbook/index.htm.** This is a site dedicated to spawning the freshwater Angelfish, which not only has lots of information but is also well designed and attractive. The site is designed to be read like a book, structured into chapters, although you can use the links to read the pages in a different order if you wish. The site starts with Chapter 1, an overview, and progresses through water conditions, nutrition and the feeding schedule, genetics, and varieties of Angelfish, before finishing up in the gallery where you will find some beautiful photographs. Each page is structured with the main article and a selection of tips down the side. Strangely the tip on the last page points out that Angelfish are cichlids and care for their young. One would have hoped that anyone who has read eight chapters on breeding Angelfish would have caught on to this, but this little whimsy does not detract from an interesting and informative site.

Further information on Angels can be found on the Fish Information Service, FINS, at **http://www.actwin/com/fish/species/angelfish.html.** This is a long article which covers a great deal of information, including diseases, the meaning of Latin names, choosing and breeding fish, and even a video of Angelfish spawning and the growth of the fry.

Keeping Oscars is an acquired taste, but it seems that those who have acquired it never want to give it up! These large and popular cichlids have their own site at the Oscar Study Page, **http://rgfn.epcc.edu/users/bh838/.** Here you'll find a page about most aspects of Oscar keeping, all written by a definite fan. You can find out all sorts of information about what is apparently the world's second most intelligent fish (visit to find out the first!); indeed, the information can be confusing if you aren't concentrating, with the subject matter ranging off to quotes from early explorers to a debate on the unpleasant practice of dying fish.

The Amazing Oscar FAQ at **http://home2.inet.tele.dk/borgerol/oscar.htm** isn't half as much fun to read, but it does serve up a lot of facts in a long question and answer session, so this might be a better bet if you need an answer fast. This includes straightforward answers, plus short dialogues garnered from newsgroups where appropriate.

The Very Fish Oscar Home Page at **http://www.ozemail.com.au/~mattech/oscar/index.html** is another labour of love from an Oscar fan, but unfortunately he seems to be a bit short of information. The attractive front page leads to one article, a brief species resume, and six pictures. The articles warrant a quick look, but the photo collection deserves a visit if only for the novelty of its composition. There are three excellent photos here, which show Oscars at their best. There are also two absolutely appalling ones, which may or may not show Oscars and one unfortunately compressed specimen who may have suffered an accident in Paintshop Pro! The links page leads on, among others, to a site which amused me greatly, so gets a mention.

This is 'Under the Sea's' (sic), presumably a member of the Campaign for Apostrophe Propogation. Strangely, this page at **http://www.erols.com/dilligaf/underthesea/oscinfo.htm** features our friend the Oscar again. The helpful text avoids pointing out that this is a freshwater fish, explaining that they live in a variety of waters! It doesn't tell us that sometimes they are peaceful and sometimes aggressive, and that they are prone to death! Visit here for a giggle, but don't rush out and buy an Oscar without looking at some of the other sites! You can also head back to the top level, from where you can find out about a variety of other freshwater fish, including catfish. The catfish page explains that if you spell the word Pleco correctly, yours will snuff it. So they haven't.

Moving back into a more sensible realm, Cichlid Mania at **http://www.escape.ca/~mhanlon/cichlidmania.html** is a comprehensive site, featuring lots of articles. Apart from the usual topics of cichlid-keeping and spawning several areas are looked at that most sites don't cover. Here you can find out exactly why they have egg spots on their tails, why many are aggressive and how you can reduce the infighting, a glossary of all the words that experienced aquarists assume you know, and lots more. The cichlid profiles page is structured by area: selecting one of these gives you a list of cichlids from that part of the world, each with reasonably comprehensive information and a photo. A particularly nice feature is that you are not only told the scientific name, but the page explains how to pronounce it and what it means. If you find scientific names a struggle understanding them better may make them more memorable and easier for you.

The Cichlid Home Page, at **http://trans4.neep.wisc.edu/~gracy/fish/**, opens with a very long page about the pages, troubles with the server, and the author, but behind the somewhat dry beginning is a wealth of information for anyone interested in cichlids. The general page explains what cichlids are, and gives very general information about their care, while the genus, common names and origin pages allow readers to find specific information on a large number of species, often accompanied by a photograph. This structuring caters for people who know the particular species they want, as well as those who are just interested in cichlids of a particular country or area. The News Page contains extracts from the cichlid newsgroup, so you can check to see if anyone else has had the same problem as you and if anyone made any suggestions. (If you want to look through old newsgroup postings, **http://www.dejanews.com** has an archive of just about every posting to every group ever made, and an excellent search engine, so this is a good place to try if you have a specific problem).

The Red Parrot Cichlid has come in for a large amount of criticism, but there are plenty of fans on the net. A message board at the Official Red Parrot Cichlid page, **http://members.aol.com/dandango2/index.html,** has postings from lots of them. The page itself explains the confusion over the origin of this cichlid, along with some photos of a parrot and her fry.

Dwarf cichlids are deservedly popular among aquarists, being relatively peaceful, very beautiful, and not requiring massive tanks. You can find out about the Apistogrammas and other dwarf cichlids on the Krib pages at **http://www.cco.caltech.edu/~aquaria/Krib/Apisto/.** There is a large range of articles here, covering such themes as tankmates, the effect of sunlight on spawning, diseases, and lots more. In addition to the themed articles there is also a collection of even more articles, newsgroup extracts and photos grouped under the names of the different fishes. This is an extensive site, and if you are interested in these little jewels you will need to set aside an hour or so to browse through it.

Although even three months have only just scratched the surface of the cichlid sites on the web (and more popping up all the time) next month we shall be leaving the cichlids for a while and taking a look at what some of the fish retailers have to offer on the web, apart from trying to sell fish!

Kathy Jinkings
(British Aquatic Resource Centre — http://www.cfkc.demon.co.uk)
(AquaSource International — http://www.aquasource.demon.co.uk)

A to Z of plants

By **DICK MILLS**

PHOTOGRAPH BY A&P LIBRARY

P FOR PULMONARIA

Sounding like something out of a medical dictionary the Lungwort (as this plant is also known) is quite a useful plant to have around the pond. Needing plenty of water during the summer it appreciates a dampish situation and fulfils another purpose for the pondkeeper — it attracts insects by virtue of its nectar.

Pulmonaria augustifolia.

Pulmonaria augustifolia

Description: A fairly easily recognised plant by its white-blotched, coarse-looking ovate green leaves. The flowers are blue sometimes tinged, or fading to, pink. Amongst the cultivated forms (see below) there are other shades of flowers available. The subspecies *P. augustifolia azurea* has deeper, more violet coloured flowers. It grows to a height of between 9in and 12in (25-30cm) with a spread of about 18in (45cm).

Cultivation and Propagation: This is an old cottage garden type of plant which often does best being left to its own devices. Having said that, it does provide excellent ground cover amid varying conditions — partial shade suits it best with plenty of moisture. A mulch covering is also beneficial. Propagation is primarily by physical division in spring or autumn on the part of the gardener but it will also self-seed itself to form mats of cover.

Other Species: There are several cultivated forms: Munstead Blue, Rubra, and also *P. longifolia* and *P. officinalis* Bowles Blue, Cambridge Blue and Sissinghurst White.

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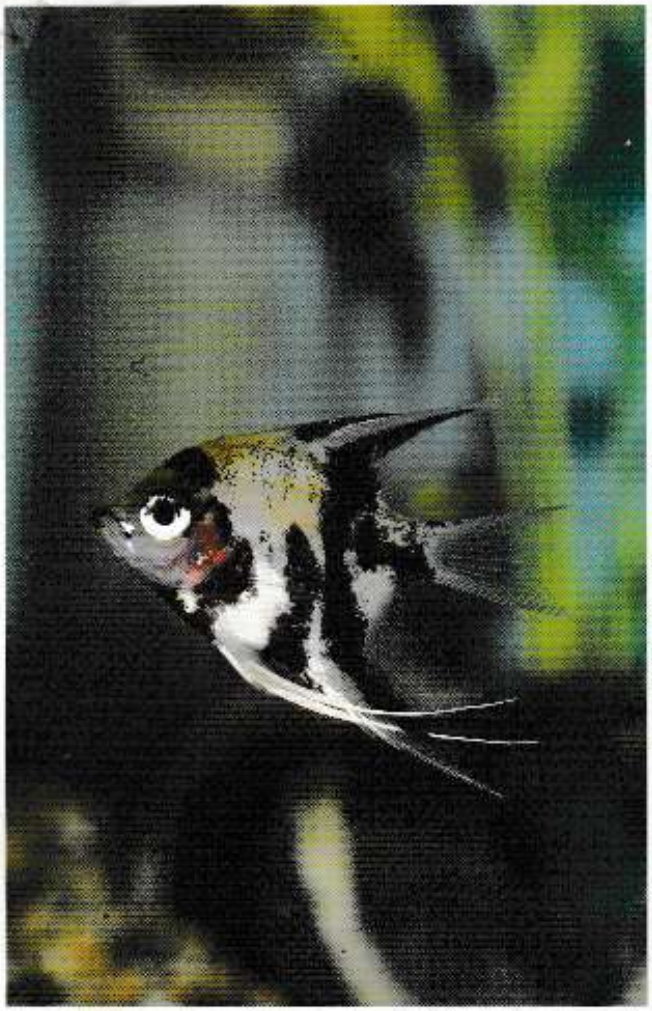
Linda Lewis listens and looks in on fishy conversations

PHOTOGRAPHS BY THE AUTHOR

Getting Your M

Angelfish, like many cichlids, use sound to a great extent in courting and territory defence.

It may come as a surprise, but many kinds of fish use sound to communicate



If you wanted to communicate with someone, how would you do it? You could simply speak to them, but that is not always possible. How do you let a member of the opposite sex know that you're interested in them without actually saying so? Or, what do you do if you want to let a colleague know something without the boss hearing? As humans we have many ways of getting our message across. We could write a note, or use mime or sign language. As regards courtship, just body language may be enough to get our message across!

What has this got to do with fish? Well, obviously they can't speak to each other, at least not using words, but they do need to communicate, and for as many different reasons as we do.

It may come as a surprise, but many kinds of fish use sound to communicate, perhaps the most well known being the Talking Catfish. Talking Catfish belong to the Doradid group and are unusual in that they can produce sound in two different ways. The first kind of sound is made as the catfish moves its strong pectoral fins to produce a rasping noise. The second way involves the swim bladder which vibrates causing it to resonate, and producing a low growl.

Outside the range of human hearing

However, the ability to produce sounds occurs across a variety of fish families. As the noises made are often not heard by us, this aspect of fish behaviour may pass unnoticed, especially as the sound produced may be outside of the range of human hearing. As scientific research progresses we will doubtless discover even more vocal abilities amongst fish that had previously been thought silent.

Many cichlids, including that most popular of species the Angelfish

essage Across

(*Pterophyllum scalare*), use sounds during courtship, and to signal their ownership of territory. Marine Damselfish and Anemonefish use calls to communicate with others in their social group. Even the humble Haddock has a repertoire of calls which are used in courtship, and between rival males.

Using electricity for location

How about sending an electrical message? All animals produce electricity as part of their biochemistry but it is in fish that this ability has developed to a high degree, thanks to the conductivity of water, as opposed to air. The power generated by some of these fish is well-documented, and reports of Electric Catfish knocking over horses are common, but fish also use electricity in far more subtle ways. Knifefish, for example, use electricity for location (the electric field they produce is distorted by nearby objects thus sending a 'picture' back to the fish) but they also use it in courtship.

A male encountering a female will send an electrical signal to her — a series of rapid pulses, and she will send back a reply, which tells the male whether or not she is ready to spawn. The enchanting Elephant-nosed Fish also use electricity in this way. They come from rivers where visibility is low and they rely on their electrical powers to find their way through murky water, and to recognise potential partners and rivals. When two males meet they exchange pulses of electricity by which they can each gauge the other's strength. Costly battles, in which both fish could be injured, are thus avoided. (If you would like to read in more depth about sound production and the use of electricity in fish I can recommend *Fish and their Behaviour* by G. K. H. Zupanc).

Where the natural environment is dark any light source will be highly-visible and can, therefore, be very effective as a means of keeping in touch. There are few places as dark as the ocean depths, and many deep sea fish produce light. Although many use this like bait to attract a meal, others have developed this ability into a sophisticated method of communication.

Flashlight Fish carry their light in pouches, just below the eye. The pouches are home to billions of bacteria which produce light as a natural by-product, rather like we produce carbon dioxide as we breathe. The fish can turn the light on and off by covering the pouch with a special flap of skin. The flashes produced allow individuals to keep in touch. In return the bacteria are supplied with oxygen and have somewhere to live.

One light-producing fish is sometimes seen for sale — the Pinecone Fish, *Monocentrus japonicus*. This marine fish is usually sold as a single specimen but to fare well it needs the company of others of its own kind. The light-generating organ is located in a small orange coloured patch located beneath the eye. If the room and aquarium light levels are reduced flashes can be seen clearly.

Alarm substance

An invisible but very effective way to send a message involves the use of chemicals. Perhaps the best known example of this involves the so-called alarm substance, which is released by an injured or distressed member of a community or shoal. Under natural conditions, other members of the group would detect the chemical in the water, even at very low concentrations. This would

Elephant-nosed fish use electricity to keep in touch.

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FRY TALK

time to go home. We had a really good day and it was a great experience and we would like to thank all the staff at North Lakes Aquatics for making it possible.

All those tanks to clean! ... at North Lakes Aquatics.

On Friday, 6 February 1998 Seascale Junior Fishkeeping Society had as a guest speaker Roger Foggitt from Tetra. His talk, entitled 'Fish Health', was wonderful and his description of the nitrogen cycle will stick in everyone's mind, I hope for ever. I, for one, will remember the little balloons for a long time to come! I'll let Joanne, Kerry and Iain relive their highlights for you.

When Roger arrived we thought it was very good fun and it was really educational; we learned more than we do at school. He made it fun with lots of little balloons. He showed us the Nitrogen Cycle and how to look after our fish and treat them when they are ill and how to tell when they are sick. He also showed us some very interesting slides of fish treatments and those affected by disease.

He brought some slides with him on fish chemistry and explained why we should not buy lots of fish at once: he showed us how the filter cycle works and told us that if there was too much waste the bacteria can't cope with it and what you would be doing is putting more waste in the tank than the bacteria can manage to clean up. So, if you've got a new tank the result is: New Tank Syndrome and/or high nitrate levels.

He told us how to manage our tanks in a fun way and told us the signs to look out for in disease and how to minimalise the risk of disease. This has helped me a great deal on how to go about emptying and setting up my tank again.

Thank you very much, Roger.

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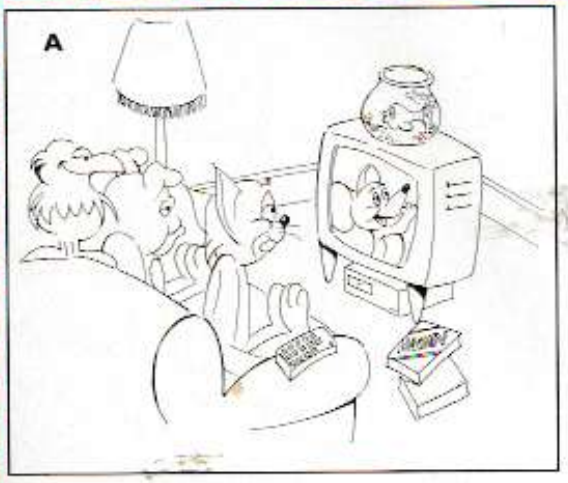

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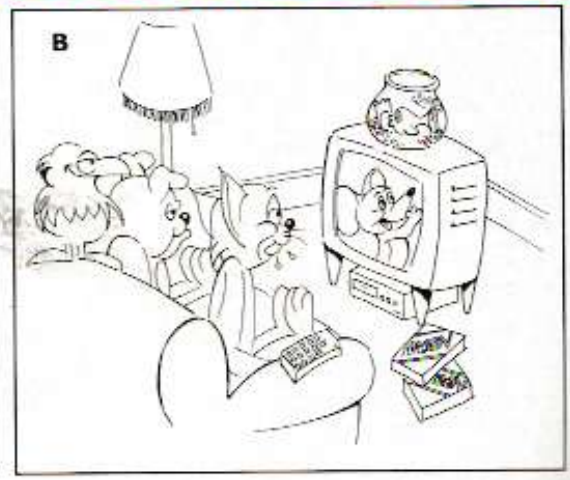

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Out & About

A&P visits IVY MILL AQUATICS

PHOTOGRAPHS BY A&P LIBRARY

So there you are, sitting in the world's largest car park — otherwise known as the M25 — nearing Junction 6 and, if you're an aquarist, probably going through a few fishy thoughts while you contemplate the vehicle exhaust pipe in front of you.

If you have a little time in hand and, let's face, in this situation what else could you be doing anyway, why not leave the motorway at Junction 6 for a look at Ivy Mill Aquatics. Follow the road signs for Godstone and drive clockwise around the one-way system, passed the village green and turn left on to Bletchingley Road heading towards Redhill. About half a mile along the road turn left into Knight's Garden Centre. Once inside the centre the familiar violet glow from the tanks of aquariums will indicate the aquatic section of Ivy Mill.

A feature of the dry goods area is the large triangular aquarium across the corner. Inside Discus and Congo Tetras may be seen making full use of the accommodation. Being of such generous size the aquarium needs some powerful lighting and this is provided by three Arcadia pendant-style metal halide fittings, some experimentation was necessary with the exact hanging position of these lamps as, combined with whatever sunshine was available through the high roof, algae growth was particularly rampant but now a happy compromise has been reached with the lamps being raised a few inches from their original positions.

For the freshwater tropical hobbyist a feature of the stock tanks must be the entire row of Apistogramma species with each tank housing a different species elsewhere, there were some splendid examples of Emperor Tetras, Nematobrycon sp., together with a different species altogether within the same genus which I had not seen before. It was not surprising, considering the pH of the water supply (around 6.5) that the number of South American Characins abounded — Pencilfish, Splashing Tetras, etc — plus some Checkerboard Cichlids (Crenicara sp).

Although some African Lake Cichlids were stocked they didn't feel quite so comfortable in these water conditions. On the other hand the livebearers appeared quite comfortable and here again was a surprise — Red-eyed Red Swordtails, which brought back memories of yesteryear when such varieties were commonly available.

A display of fancy Goldfish was faced across the aisle by the aquatic plant display, now in the familiar cataract sequence of tanks format.

Outside but still undercover were the holding tanks for Koi and Goldfish and an excellent selection of statuary for pondside, or patio, decoration. Outside I found a good presentation of water plants including Water-lilies and vanilla scented Water Hawthorn, Aponogeton distachyus. The latest filters were there, too: the complete range of Cyprio's Biotorce units plus some large vortex units which no doubt give many a hobbyist a second thought when contemplating the daunting task need to excavate the necessary hole!

When A&P paid its visit it was also the occasion for 'on-site' alterdances too by manufacturers in a special aquatic weekend feature; Nishikoi and Hagen displays were backed up by personal advice by representatives but the staff, under the leadership of Simon Flood, were equally up to talking knowledgeably and authoritatively to customers.

Forming part of a large garden centre complex has many advantages, one of which is that the non-fish interested members of the family have something else to look at whilst you idle away an hour or two with the fish! It is a shame that marines haven't managed to get a space yet.

With easy transport access plus all these attractions there should be no excuse for not visiting Ivy Mill. Knight's Garden Centre can be found at Bletchingley Road, Godstone, Surrey RH9 8NB. Tel: 01883 742665.

Opening hours are: Monday-Saturday 8.30am-5.30pm (with late nights until 8pm Wednesday-Friday until mid-June); Sundays 10am-4pm.

▲ TOP OF PAGE One of the many display tanks.

ABOVE The undercover Koi holding tanks.

Nick Dakin says a name can be deceiving

PHOTOGRAPH BY THE AUTHOR

Sharp Dressed Urchins

The Pencil Urchin, Heterocentrotus mammillatus

CLASS: ECHINOIDEA

Anyone still familiar with their history of the French language will recognise at once the fact that the word Urchin derives from the old French 'Hurcheon' meaning hedgehog (it also means hunchback but that's another story, Esmerelda ...). Therefore, the common English title Sea Urchin is aptly-drawn from the more suitable translation of Sea Hedgehog.

Dickensian enthusiasts will also be interested to note that the phrase 'street urchin', so favoured by the author, were so christened because they (or more correctly their unkempt, spiky hair) resembled a hedgehog. Although a very popular Victorian term it was first used in the English language as long ago as 1530.

> Anywhere suitable food is to be found Urchins make an appearance

All fascinating historical facts, but where does that leave us in our discussions about the real thing — Urchins that is, not hedgehogs!

There are estimated to be around 750 species of Sea Urchin in the class Echinoidea throughout the world. From tropical, through temperate, to icy oceans; from the very shallowest to the very deepest abyss, in fact, anywhere suitable food is to be found Urchins make an appearance.

The species are so varied that the smallest has a body (more correctly called a 'test') no larger than 1.2in (3cm), whilst the largest has been measured at 10in (25cm). Depending upon the species spines may exceed 12in (30cm) or be barely noticeable at only a few millimetres.

Diet

Many species graze on algae, scraping it off the rocks with the aid of five powerful jaws located on the underside of the body. Waste material is excreted through the

anus on top of the test. However, a few species only have three jaws and still fewer look more like a Sea Cucumber with an elongated body, jaws at the front and anus at the rear.

Not all species are herbivores, though, and aquarists must be careful that they do not introduce uncommon species that make a meal of soft-bodied invertebrates such as Sea Anemones and Leather Corals.

Jugglers

Sea Urchins are true 'jugglers of the sea'; not only do they possess moveable spines but they have a group of smaller secondary spines and rows of feet with which they can perform many useful tasks such as clearing the body of debris, ridding it of harmful larvae looking for a home, manoeuvring pieces of food into the mouth, as well as helping in the general locomotion of the animal ... quite a list of achievements.

Sexing

Apart from one or two isolated cases all Sea Urchins are either male or female. Living in large groups, as they tend to do, reproduction involves mass spawnings at certain times of the year. Eggs and sperm mix together locally before being dispersed far and wide in the plankton layers to develop as larvae. When fully formed the young adults migrate back to the sea floor where they mature.

Interestingly enough, Sea Urchin larvae are most weird and strange in appearance; their individual appearance being so distinct that species are easily identified by the larvae alone.

As far as is known Sea Urchins are yet to be bred in captivity.

Venomous

The vast majority of Urchins possess venomous spines, which provides a good degree of protection against potential predators (mostly Triggerfish) and a safe home for some fish and crustaceans which hide therein.

The ferocity of a sting varies markedly from species to species. The Pencil Urchin (*Heterocentrotus mammillatus*) and the Mine Urchin (*Fucodons tribuloides*) have very blunt spines and are incapable of stinging at all. The Long-Spined Urchin (*Diadema savignyi*) on the other hand has very sharp spines which are venomous and can give a painful wound. Exceptional species such as *Toxopneustes pileolus* — the Poison Urchin — can be extremely dangerous to all creatures, with several human fatalities being reported. Fortunately, it is hardly ever found in the aquarium trade, and then only by accident.

Safety first

If stung by an Urchin the injured person should dip the wound in alcohol or vinegar and not try to extract the tip of the spine if completely embedded in the skin. Although painful for a short period (about one to two hours) the tip usually dissolves away under the skin quite quickly. If an allergic reaction sets in (generally in people already allergic to bee and wasp stings) then a visit to the nearest hospital casualty department would be in order as soon as possible! Of course it is far better that this sort of situation is avoided altogether by keeping hands and arms well away from them while performing 'in-tank' maintenance chores. In addition, it is best to always use aquarium tongs if a specimen must be moved, taking care never to pull too hard on the spines. Far better to try and dislodge it from beneath first.

Night owls

Sea Urchins are nearly all nocturnal feeders and only become active during the hours of darkness. They tend to hide during the day in a sheltered location such as rock crevices.

Destructive

In the aquarium Urchins are capable of dislodging rocks and corals if not firmly-positioned and sharp-spined species can pierce Soft Corals and Sea Anemones in confined spaces. It is wise to prepare for these eventualities before introduction.

Problems

Marinists are often disturbed because an Urchin has apparently not moved for days and is, to all intents and purposes, dead! Far from being dead, some individuals wander around the aquarium at night, only to return to the very same spot by morning, giving the impression of never having moved.

If the hobbyist wishes to test the health of a particular specimen it can be lightly tapped with a pair of plastic aquarium tongs; if it falls off easily and shows no sign of righting itself then it is most probably dead. If it cannot be dislodged then it is likely to be a healthy specimen and merely responding to its nocturnal instincts.

The most common health problem concerns the shedding of spines for no apparent reason. Unfortunately little is known about exactly why some Urchins cast off their spines, all at once, or a few at a time. Certainly, the shock of being moved can trigger it, as can poor water conditions such as low pH and water poor in calcium. Some 'bald' Urchins survive and re-grow their spines very slowly if conditions improve; sadly most tend to die in this condition. Once again, the aquarium conditions must be checked and confirmed to be suitable well in advance of introducing an Urchin.

Beginner's choice

The Pencil and Mine Urchin make good introductions as does the Common Urchin. Long-Spined Urchins, whilst readily available, are slightly more sensitive to poor water quality and lack of suitable grazing material.

Tank and water conditions

Choose an aquarium of 25 gallons capacity or above. It should be a reef-type aquarium with plenty of algae. pH: 8.1-8.3; Temperature: 24-26°C (75-79°F); Ammonia and nitrite: Zero; Nitrate: Below 25ppm; Copper: Zero; Calcium: 350-450ppm; KH: 7 or above; Specific Gravity: 1.021-1.025; Dissolved Oxygen: 6-7ppm; Water changes: 15 to 25 per cent every two weeks depending on stocking levels; Activated carbon filtration and protein skimming as standard.

Feeding

As we have seen many species kept in the aquarium require large quantities of algae on which to graze. This may take the form of macro-algae (ie. *Caulerpa* sp) or more usually micro-algae. They do not favour nuisance algae, however, and should not be considered as a predator for this particular problem.

Visit Nick Dakin's website at: http://www.nickd.clara.net

Ronny Lundkvist shares his aquarium-keeping experiences with specimens collected in Florida

PHOTOGRAPHS BY THE AUTHOR

The Sailfin Molly

Poecilia latipinna

Freshwater biotope along Tamiami Trail about 50 kilometres west of Miami. In March 1990 the water temperature was 24°C, the pH 8.5 and the dH 12.

The range of *Poecilia latipinna* is from Wilmington in North Carolina south to the Yucatan peninsula in southern Mexico. The species is rather abundant in the warmer parts of Florida, ie, the Everglades, and is found in fresh, brackish and pure salt water.

In March 1990 I made a trip to Florida in order to look for and collect Mollies. The freshwater biotopes that were examined were all located between Tamiami trail, west of Miami, and the southernmost part of the peninsula.

The species is rather abundant in the warmer parts of Florida, and is found in fresh, brackish and pure salt water

The pH value varied between 7.5 and 8.5 and the dH ranged from 7 to 13 but mostly from 10 to 13. The water temperature varied between 23-26°C. I also found Mollies in the saltwater lagoons of Key Largo, the Florida Keys. The water temperature there measured 27°C and the pH value was 8.0. The salinity was very high and measured 1.028, probably due to high evaporation.

The colouration of the male is as seen in the photographs. The female is duller. The large dorsal fin is only present in the males but it is not always common among the freshwater races. Melanistic specimens are sometimes found and I was lucky to find one speckled female in a lagoon at Key Largo. The

size of the male is genetically conditioned according to Trexler and Travis. Some males get sexually mature when they are very small and others when a much larger is reached. I found males measuring 50mm in the canals but most of them were about 35-40mm. They did not have the large sailfin or the colouration as in the photographs. Specimens collected in the marshes seldom reached more than 40mm.

Among the specimens of the saltwater strain found at Key Largo there were both mature males with plain colouration measuring 30-35 mm as well as large, brightly-coloured specimens with huge sailfins in the same biotope.

I brought back nine specimens of the freshwater strain from two different biotopes. They were all very tiny and sexually mature except for one male that developed bright colouration and a rather large dorsal fin in the aquarium at the length of about 50mm. The males that already were sexually mature when collected never developed large dorsal fins, remained plain and did not grow any further.

Difficult to create same conditions

Why then did one male among the imported specimens develop a large dorsal fin? Probably due to the fact that the conditions were good, perhaps even better than in the natural habitat in this case. It is hard to create the same freshwater conditions as in the Everglades. As the ground in southern Florida mainly consists of limestone the water is hard and alkaline. Moreover, there is a constant flow of fresh water. According to Trexler and Travis the mortality rate is high among the sailfins in fresh water if it does not have the quality mentioned above.

As the Sailfin Mollies seem to do best in salt or brackish water the easiest way to make them thrive in a tank is to create a similar environment. Of course you must have plants that can stand brackish water, for example *Cryptocoryne ciliata*.

After having been treated against fungus and Ichthyophthirius (White Spot), the females of the two races gave birth. I kept the offspring of the two races separated and never put more than 30 young specimens in a tank of 150 litres of water. The water temperature was a constant 27°C and I changed one third of the water every second week. I also added one spoonful of salt (the kind that you use for marine tanks) per 10 litres of water. The Sailfin Mollies require absolute cleanness as well as vegetable food twice a day.

According to some handbooks the temperature should not exceed 20-24°C in order to avoid too early-developed males. My Mollies were collected in the tropical zone and lived in biotopes containing large quantities of water that keep rather high temperature even during temporarily chilly weather. As mentioned above the size of the male depends on its inheritance under normal conditions. When exposed to sudden falls in temperature the Sailfin Molly does not feel good and is apt to contract White Spot. If you use a thermostat heater you will avoid such disasters. I do not think that it is the exact temperature level itself that is important but the ability to keep the

Sailfin Molly. Tank-raised male, 75mm, the freshwater strain.

Sailfin Molly. Male from the marshes that developed a rather large dorsal fin and bright colouration in the aquarium.

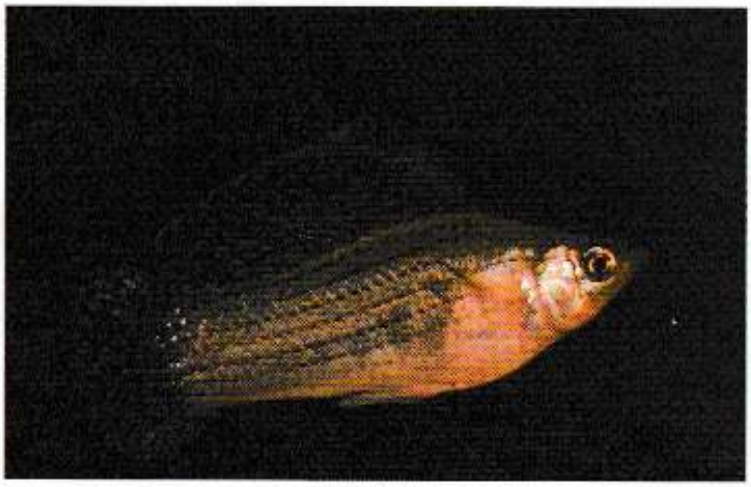
temperature quite constant. Of course it should not drop below 20°C, even bearing in mind the species is also found in the sub-tropical zone.

Add salt and fresh water regularly

Water containing too much urine also hinders growth; in aged water they are susceptible to fungus following any wounds caused by quarrelling, being bitten or some other event. By adding salt and fresh water regularly you will avoid this.

THE SAILFIN MOLLY ... abundant in the warmer parts of Florida

Following my own recipe the young reached a length varying between 65 and 75mm after 15 months. Even if the temperature was 27°C they did not get sexually mature until after 10 to 12 months. All of them developed more or less large dorsal fins probably due to the fact that they carried 'large' genes. They grew even larger than the specimens that I collected in saltwater at Key Largo. This sounds perhaps incredible but by studying their natural habitat and trying to create a similar environment you may get marvellous results.



Sailfin Molly. Male from Key Largo, the saltwater strain.

Literature

Trexler, J. and Travis, J. (1987) Regional variation in habitat requirements of the Sailfin Molly with special reference to the Florida Keys. Florida Game and Fresh Water Fish Commission, Tallahassee.

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Focus on ...
AQUARIUM EQUIPMENT

Filtration Fundamentals

Roy Osmint tackles this fundamental subject

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The importance of an efficient filtration system in helping to establish and maintain quality conditions in the modern aquarium should certainly never be underestimated. On the other hand, to overestimate its significance would be equally unwise. For to do so might easily lead to the mistaken conclusion that in some way such equipment represents a panacea capable of sustaining quality water whilst negating the requirement for proper management practices.

Most non-aquarists or newcomers to the hobby if asked to define the purpose of a filter system would, I confidently predict, answer ... "to keep the water clean!"

Clean water in this context is often taken to mean clear water, uncloudy, devoid of suspended particulate and consequently aesthetically pleasing. But clarity of water does not necessarily denote quality of water and the two must never be confused.

Having then established this important fundamental truth and recognised that filters can help achieve these dual requirements of clarity and quality only when associated with proper maintenance and disciplined water management routines, we can go on to look at the whole question of filters and filtration in more detail. What can we expect from them? How do they function? Their individual advantages and disadvantages, strengths and limitations and how in addition they can be used to change or influence the chemical composition of the water in order to create specific habitats.

◀ Choose a size of filter suitable for your aquarium's size and set-up.

Focus on ...

AQUARIUM EQUIPMENT

Filtration Fundamentals

Water should be regarded as the most essential part of the aquarist's 'equipment'. Its composition, however, easily becomes altered through its propensity to dissolve the salts, gases and organic matter of other elements with which it comes into contact. Its final chemical make-up can therefore be infinitely variable. Hard or soft. Acid or alkaline. Fresh, brackish or saline, as well as of course polluted or unpolluted.

To fishes, water represents an entire life support system. It is their complete world — their very atmosphere.

In any inhabited body of natural water nature has its own effective systems of cleansing and purification. Water does not remain static, it drains through the earth, evaporates into the atmosphere and is constantly refreshed and replenished through rainfall. Impurities caused through fish waste products are also quickly rendered safe as a consequence of rapid biological breakdown.

Within the artificial underwater world of an aquarium such natural systems cannot operate in the same way. The situation is made worse by virtue of the fact that fish stocking levels in the aquarium are obviously extremely high when compared with those of any natural aquatic habitat. This is where filters of various types can be used in conjunction with regular tank maintenance ensure that the aquarium system always remains in good condition.

Aquarium filters come in a wide range of shapes and sizes from simple, relatively inexpensive devices through to complex and costly units. But whatever filter is finally chosen it will perform in one or more of three ways — mechanically, biologically or chemically. Most modern systems are based on a combination of at least two of these.

▼ This internal filter has a wet/dry chamber for complete biological filtration performance.

Mechanical Filtration

This is the filter method that probably best fits the newcomer's concept of what filtration is about. By removing suspended matter and other debris it helps keep the aquarium looking crystal-clear and thus attractive in appearance. There are numerous types of filter media that can be successfully utilised in a mechanical system, these include foam, floss, sand, gravel and ceramics among many others.

Almost all forms of media will in addition to mechanical also give biological filtration. But more about this later!

A mechanical filter can be powered by an air pump as in the case of a simple internal or external box filter, or electrically driven.

The former is likely to provide adequate results in the smaller aquarium where it will not be overburdened, or when used as a supplementary system for chemical purposes. The latter is ideal for larger tanks or when sizeable messy fish are involved.

Power filter units are available in a variety of sizes and designed for either internal or external use. The most simple form being a basic canister containing a power head to circulate the water and a block of foam to remove solid particles. Larger models often have the facility to incorporate other filter media as well, the water then passes through each in turn before being released back into the aquarium. External units clearly have the advantage of being more convenient to clean and maintain. Another plus is they do not take up valuable tank space or detract from your carefully-designed aquascape. On the other hand, they are likely to be more expensive to purchase and tricky to install, often requiring some modification to the aquarium and/or hood. This type of power unit also allows water currents to be generated for those species that favour such conditions.

Another filter now frequently seen is the internal multi-chamber unit. A sponge first cleans the water of solids, it then passes through the other compartments back into the aquarium. Some models of this filter employ what is known as a wet/dry system with one chamber filling with air

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Filtration Fundamentals

before then being forced out by water. These filters are often used to achieve all three filter methods, mechanical, biological and chemical.

All, however, require frequent maintenance if they are always to give optimum performance. Foam quite quickly becomes clogged with trapped solids from the water. Cleaning is an easy task simply necessitating rinsing through using water from the aquarium, not from the tap otherwise bacteria essential to the biological filtration process will be destroyed.

Biological Filtration

One of the principal waste products generated by fish is ammonia, an extremely toxic substance which quickly pollutes their environment if not rapidly neutralised. The neutralisation process is known as nitrification.

The first stage of nitrification involves reducing the ammonia's toxicity, through bacterial activity, by converting it into either less-harmful nitrites. Although less toxic than ammonia, nitrites are still extremely injurious to fish and are only neutralised when a further stage in the cycle has been completed. This is undertaken by a different group of bacteria that act upon the nitrites eventually converting them into nitrates. These are comparatively harmless to fish although sudden exposure in high concentrations may in some circumstances affect growth rate.

The nitrogen cycle, being a natural process, will operate in any mature body of water, including the aquarium, but because this almost inevitably has an extremely high density of fish for the volume of water involved it can quickly become overburdened and unbalanced. This is where biological filtration can be of immense value by enhancing and supporting these crucial bacteria populations with continual supplies of oxygen and waste products through the filter. The filter media itself provides them with numerous surfaces to colonise.

It is important to remember that any filter using biological processes must be kept running continuously. If it is switched off for any reason the bacteria colonies will start to expire through lack of oxygen whilst it takes many weeks for the filter to mature and the colonies to build and work to maximum efficiency. Without the vital oxygen supply they can perish in just a few hours.

The most well-known and popular biological filter is undoubtedly the undergravel system.

The filter consists of a plastic plate perforated by numerous small apertures that sits on the base of the aquarium with one or more tubes rising from it. Gravel, which should be at least 3in deep, is then placed on top and utilised to furnish the tank in the normal way.

The system is operated by an air pump (or power head) which generates a continual flow of water through the gravel. This can be in either direction, upwards or downwards.

General maintenance of this filter is extremely straightforward only requiring the gravel to be frequently disturbed to prevent clogging. This is best carried out during the regular partial water changes, using a siphonic gravel cleaner.

The principal disadvantage with an undergravel filtration system is that occasionally it will require thorough cleaning. For this to be carried out effectively it is necessary to strip the aquarium completely down.

This form of filter may not also always be ideal for cultivating aquatic plants as the constant flow of water through their roots can cause disturbance. This is, in fact, a highly contentious subject among aquarists and one that in any case can be overcome. But as a filter method there is no doubt that it can provide extremely good results.

Chemical Filtration

As aquarists we will probably be interested in keeping fish species originating from across the world, whose natural water chemistry is likely in many cases to be very different to that readily available to us.

There may be occasions when it is necessary (or desirable) to alter the chemistry of local water in order to simulate a specific aquatic environment. This is where chemical filtration can help.

Fundamentally there are two methods by which the chemical composition of aquarium water can be adjusted. Firstly, by removing or reducing the presence of certain unwanted elements from it; secondly, by introducing or increasing desired elements to it. An example might be where an aquarist living in a hard, slightly alkaline water area, wishes to specialise and perhaps breed fish species

Focus on ...

AQUARIUM EQUIPMENT

Filtration Fundamentals

originating from areas where the water is naturally soft and on the acid side.

By utilising within a suitably-designed, compartmental internal or external filter ion exchange resins and aquarium peat for instance (both available from good stockists) the hardness and alkalinity of the water can over time be reduced, thus creating conditions closer to the fishes' natural ones. Other required alterations and/or adjustments to water chemistry can be made in similar manner using different types or combinations of filter media.

Summary

Filtration is a largely controversial subject and one that has long been argued and debated among aquarists.

An aspect of the matter that seldom comes under dispute, however, is that filtration itself is an extremely useful, if not vital, piece of fishkeeping equipment. One that in conjunction with proper maintenance and regular partial water changes can help provide both a healthy environment for our fish and a pleasing and relaxing underwater feature for ourselves.

In some circumstances two completely different filters may be the ideal solution, such as a power filter operating in harmony with an undergravel system. In fact such an arrangement probably offers the best of all worlds in total filtration. But in others a more gentler approach may be called for. Perhaps where an attempt is being made to breed bubble-nest builders and surface disturbance would be unhelpful. Or when raising small and delicate fish fry that could easily be drawn into a powerful filter.

Choosing the most appropriate filter for a particular aquarium application is clearly an important decision. With the number of different systems and brands now available, not to mention prices, each having their own particular characteristics, the whole thing can become a minefield of confusion.

The most satisfactory way of cutting through this confusion is to acquire a basic understanding and appreciation of what filters do, and the way in which they do it. Armed with these filtration fundamentals you will be better placed to match a filter to your own individual aquarium requirements.

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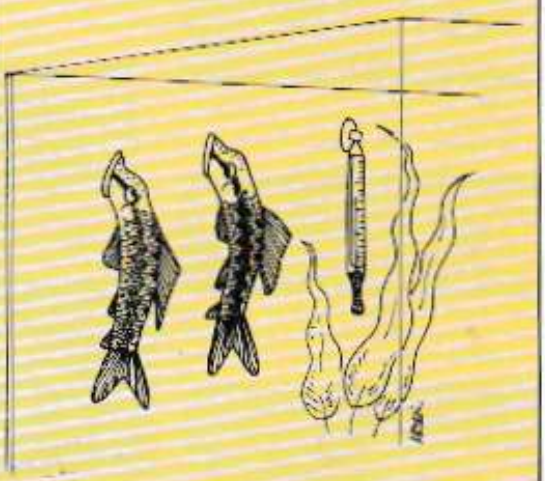

"It doesn't matter how hard you suck, it still tastes like glass!"

FROGS & Friends

By BOB and VAL DAVIES

Adult Red-spotted Newt. The red spots are all that remain of the juvenile colouration and vary from specimen to specimen.
PHOTOGRAPH: BOB & VAL DAVIES

NEWTS

Having always had an interest in newts it was a pleasure to see recently some Red-spotted Newts (*Notophthalmus viridescens*). This small attractive species from the USA is roughly the size of our Smooth Newt and is relatively easy to cater for yet they are not as frequently imported these days as they once were. Together with their relatives, the Black-spotted Newt (*N. meridionalis*) and the Striped Newt (*N. perstriatus*) they often featured regularly on dealers' lists. The most likely explanation is that demand is small and dealers tend to import only species which sell readily.

Amphibians generally are less popular than reptiles — snakes tend to be the most popular. Large frogs such as Horned Frogs (Ceratophrys spp.), White's Treefrogs (*Litoria caerulea*) and African Bullfrogs (Pyxicephalos spp.) are in demand possibly because they are relatively easy to feed but although a few amphibians are diurnal the majority are nocturnal/crepuscular which tends to be offputting. Also some exporters in the USA no longer guarantee live delivery on amphibians which increases the risk to importers.

Newts can be fascinating subjects although many species spend much of the year hidden. The main activity is in the breeding season when they enter the water at which time they are easy to feed as they will snap at anything edible including tiny pieces of raw, lean beef although this is not recommended as a permanent, exclusive diet. On land their food has to move. During the aquatic stage many species will accept pellet food (sold for aquatic Frogs and Turtles). In our collection Alpine Newts (*Triturus alpestris*) which remain totally aquatic have thrived and bred yearly on these pellets for many years with very little else apart from an occasional earthworm.

Newt courtship is engaging to watch as the males perform their tail-waving courtship ritual: fanning their scent towards the females. Other attractions include the colourful courtship livery (including dorsal crests) developed by the males in the Spring — this is mainly seen in *Triturus* and *Cynops* species. Movement underwater is fascinating, as they collect air at the surface and slowly descend, expelling air to adjust their buoyancy at the required level. Some species are totally aquatic which makes feeding easier — during the terrestrial stage live foods such as earthworms can quickly disappear into the substrate.

Young Red-spotted Newts are known as 'Red Efts' from their colouration during the first two to three years when they are terrestrial. This stage can be bypassed if the larvae are kept fully aquatic.

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Thanks to Jersey Wildlife Trust captive-farmed specimens of the world's rarest tortoise — the Ploughshare Tortoise (*Geochelone yniphora*) may soon be released into the wild in Madagascar to join the less than 400 (estimated) existing wild specimens. The project has been ongoing since 1986.

REPTILES AND AMPHIBIANS IN IRELAND

Readers old enough to remember 'The New National Song Book' at school may be familiar with the tale about St. Patrick who in Ireland "gave the Snakes and Toads a twist and banished them forever".

This is not quite true, apparently that saintly gentleman missed some species. The Common Frog, Natterjack Toad and Smooth Newt still exist there. A recent survey in Ireland also contains 200 reports of the Common Lizard with records in some counties still being incomplete.

THREATS TO SNAKES

Grass Snake — easily distinguishable from the Adder by the yellow collar.
PHOTOGRAPH: BOB & VAL DAVIES

Herpline No. 5 (Summer 1997) — the newsletter of the Herpetofauna Groups of Great Britain and Ireland, contained a report that plastic netting, used to cover fruit, vegetables and garden ponds is proving to be a hazard for Grass Snakes which are increasingly becoming entangled in it. Once they are snared they die from heat exhaustion, strangulation or attack by predators unless removed in time by a sympathetic human. Unfortunately snakes are feared by many people — the harmless Grass Snake frequently being confused with the Adder which is not as dangerous as people think.

Also in the same Newsletter the Recording Officer of the Sussex Reptile and Amphibian Group describes numerous telephone calls concerning snakes. In most cases the identity was mistaken but many people wanted 'rid of them'. Some callers had killed an 'Adder' in the garden. Other reactions to snakes in the garden included turning a hose on the creature and pouring boiling water down the hole where the snake had disappeared. No one particularly wants to be bitten by an Adder but, generally speaking, the bite is no more painful than a bee sting. However, some people are allergic, but even so deaths from Adder bites in Britain are a very rare occurrence. The rational thing to do is familiarise oneself with the two species — there are distinct differences, but unfortunately innate fear of snakes often precludes rational thinking.

WINE THREATENS CHAMELEONS

Natal Dwarf Chameleon (Bradypodion thamnobates) related to the Cape Dwarf Chameleon but enjoys a safer existence.
PHOTOGRAPH: BOB & VAL DAVIES

Since Chameleons have long been one of our main interests a picture and article concerning the Dwarf Cape Chameleon (*Bradypodion pumilum*) in the *Sunday Telegraph* (5 April 1998) caught our attention. The article stated that this species, which lives in the Stellenbosch area of South Africa, has become endangered by the use of mechanical harvesting and pesticides in the vineyards. Whilst we enjoy a glass of wine the idea of grape treaded with bare feet, as once used, is not a pretty thought but according to the report mechanical harvesting also collects the Chameleons and they are pressed along with the grapes — some of these wines are said to have a 'grassy aftertaste'!

One vineyard owner, realising their valuable pest-control function, has introduced 'Chameleon-friendly' methods; picking by hand, spraying only in winter and using lower lorries which do not knock Chameleons out of the trees. Two of his wines carry a picture of the species on the label.

The South African Chameleon Society has also introduced a survival programme — removing threatened Chameleons from vineyards to National Parks where they are protected and are becoming a tourist attraction.

We kept two closely-related species of Dwarf Chameleon some time ago. They are delightful little creatures which are perfectly harmless insectivores although, in common with other Chameleons, in many of their native habitats they are often regarded with superstition by some workers who tend to be indifferent to their fate. The thoughts of them going into wine is repulsive on two counts: firstly, the idea of crushed Chameleons in wine and secondly the eradication of the species in such a manner.

UNUSUAL DIETS

Although certain reptiles are totally, or partially, herbivorous this habit is not usually associated with Frogs. An article in the Natterjack No. 36 contains a report of a Frog (*Rana hexadactyla*) in India which feeds mainly on leaves, flowers and some types of algae. Adults do take some fish and frogs prior to breeding.

Although Chameleons are insectivorous the Yemen Chameleon (*Chamaeleo calyptratus*) is said to accept plant material such as lettuce although our specimens thrived and bred without it. A colleague also reported that his Jewel chameleon (*C. lateralis*) deliberately ate certain parts of Passion Flowers with which the vivarium had been furnished.

CITES NEW

Three species of reptile which in past years frequently appeared on importers' lists can no longer be imported into Europe on the advice of the EC Scientific Review Group — under new EC regulations the SRG can make such recommendations where it is thought that trade endangers a species. The three species are the Papuan Monitor (*Varanus salvadorii*) from Indonesia, Kenyan Sand Boa (*Eryx colubrinus*) from Tanzania, and the Oriental Rat Snake (*Ptyas mucocus*) from China and Indonesia.

Since this ban only applies to Europe they will no doubt still be exported to countries such as the USA and Japan.

The new season has brought out several items of interest to the pondkeeper, either directly or indirectly

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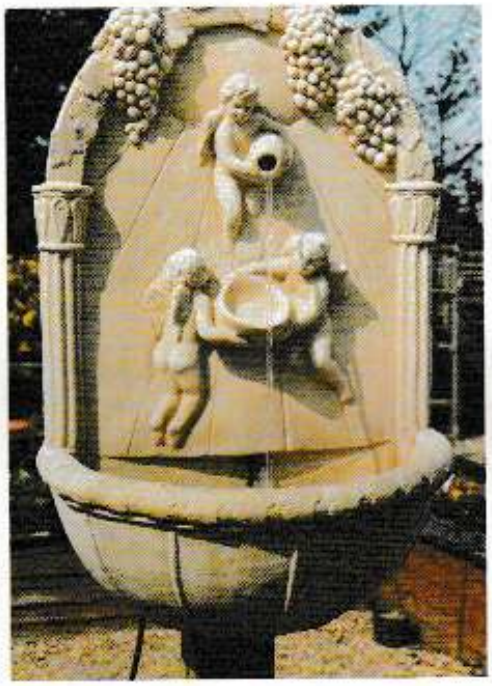
Pond Accessories



There has been an apparent rethink about filtration systems with much of the necessary equipment actually being located in the pond itself rather than being external to it. Whether this is merely a cosmetic exercise or as a response to more compact, out-of-ground raised ponds becoming popular, is anyone's guess; maybe an upsurge in the number of indoor 'conservatory ponds' having limited surrounding space may also have had a bearing. Anyway, for whatever reason, there are a couple of in-pond items to talk about.

Jet Stream Filter

The Jet Stream Filter from Blagdon is something different, apart from sitting in the pond. It is also a very practical and firm base for a fountain jet, the 'ballast' being the filter media contained within the cylindrical base; all it needs to drive it is a pond pump. There are one or two advantages in its intended mode of operation: the unit can sit out in the middle of the pond (or wherever you want the fountain to be) and it is fed by a hose from the submerged pumps' output. The pump itself can be sited on a marginal shelf or alongside the pond edge, for easy maintenance. If the pump is equipped with a larger foam strainer than provided originally then it follows

POND ACCESSORIES ... new items of interest to the pondkeeper

that the Jet Stream Filter will not become blocked so frequently and can provide the most efficient biological filtration service, courtesy of the Filtroc 3000 and other high-performance media. Illustrated is the Jet Stream 500 unit.

Aquamaster Filter

Still within the pond the Aquamaster filters from Sacem are aimed at in-pond filtration. These come in three models — 1000, 2000 and 2500 — the numbers referring to water flow through the unit expressed in litres per hour. Applying the usual recommended water turnover rates for ponds (ie, half the pond volume per hour) it can be quickly calculated that these filters can cope with pond capacities of 2,000, 4,000 and 5,000 litres (approximately 440, 880 and 1,110 gallons) respectively.

The increase in water flow is obviously achieved by having larger pumps fitted to each unit but, in addition, succeeding units upwards from the base model have additional double cartridge foam filtration modules fitted. Each 'half' of each unit can be removed in rotation over a period of weeks for regular maintenance and rinsing without upsetting the biological balance of the unit as a whole.

In the larger model there is a selection of fountain heads — jets, bell-head, etc. A 'bleed-off' 'T' piece on the fountain head can be used to regulate the height of the jet or even feed a submerged UV unit. A moulded in handle allows for easy removal from the pond, although the largest unit may take some lifting when soaking wet and filled with detritus!

Aqua-skim

Moving to the surface of the pond, the Aqua-skim is a clever device for collecting floating debris (as well as duckweed!). Water is fed into the device from a pump and sprays water into the mouth of a collecting bag which floats just below the surface. A clever piece of specially-shaped wire holds the mouth of the bag ever open and the bag is easily removed for regular emptying. Left operating overnight the skimmer should have no trouble in clearing most of any annoying surface material and it could then be switched off during the day if preferred. Fitted with a large enough length of hose from the pump it can be set in any position around the pond to do its job. For optimum performance a pump having a capability of around 1,400 litres/hour (310 gph) is recommended.

Aqua-level

From the same manufacturer comes the Aqua-level, something quite unlike anything you've seen before. It is entirely 'low tech' with no electricity or sophisticated sensing equipment. At first glance you think that someone has dumped

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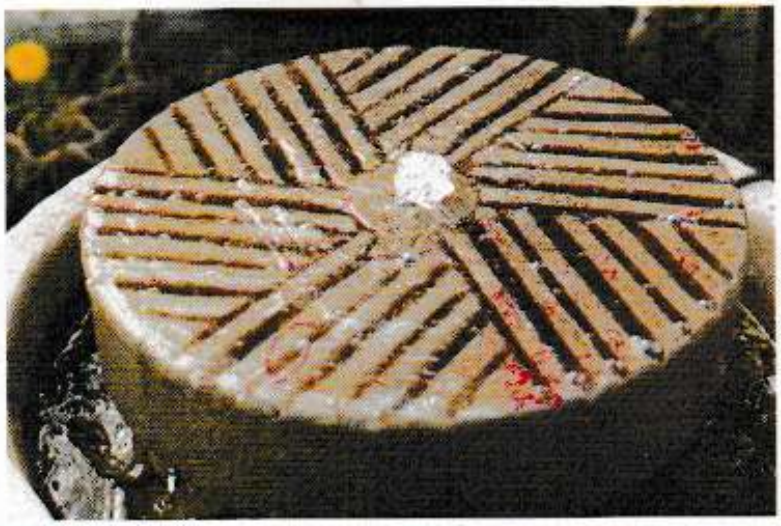
a Homepride 'graded grains means finer flour' Man in the pond for all it needs is a cheery face peering out at you from under the green 'hat'. The way it works is simplicity itself: mounted at the suitable height in the pond and connected to the mains water supply, a polystyrene ball rises and falls in sympathy with the water level; as it falls it uncovers jets under the 'hat' to open to allow water to flow into the pond thus maintaining the correct level and making up any losses that may occur through evaporation — or even water removal by the pondkeeper. No doubt it could cope with a leaking pond very efficiently too but, unless you were on a water-metered system, how would you ever know!

The Millstone Fountain

Water movement holds many attractions, both visual and audible,

POND ACCESSORIES ... new items of interest to the pondkeeper

away from the pond as well as in and around it. The choice of millstones as a centrepiece for a water feature has long been popular although not everyone has sufficient space for units modelled on the real thing, which may be quite large when you consider their proper use in wind- and water-mill situations. The Millstone Fountain is only 43cm in height with a total diameter of the complete unit being 61cm. The actual 'stone' itself is criss-crossed with darker 'weathered' lines. The ornament is made of reconstituted stone and comes complete with it own pump and is ready for use. It is equally suited to indoor or outdoor use.



Urns, Pitchers, Amphorae and Wall Fountains

There's nothing like a bit of 'antiquity' to give your pond or, in this case, its surroundings, an established, 'been here for years' look. It is hard to realise that the aged Urns, Pitchers and Amphorae have not been dredged up from some ancient shipwreck; used to good effect on a suitably designed patio or 'dry' garden say with a fishing net or not you could in a short space of time, travel back in time to more serene atmospheres when all you might hear is the wind playing delicate sounds through an Aeolian Harp.

The Wall Fountains from Kinsman can liven up a quiet patio, gently re-circulating water through artistically-designed outlets such as Cherubs, but there are other designs to choose from with ornate troughs to act as reservoirs in addition to shallow basins.

Whether it be technology to add to the efficient working of your water garden, ornaments to provide atmospheric settings or a small water feature to produce therapeutic relaxing sounds to patio or conservatory, your local water garden centre will be able to cater for your various needs — they're just waiting for you to visit.

WE WOULD LIKE TO THANK CHENIES AQUATICS, FARNHAM ROYAL, BUCKINGHAMSHIRE, FOR ASSISTANCE IN THE COMPILATION OF THIS ARTICLE.

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OASE

BY
ANDY HORTON

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

WORLD OCEANS DAY

World Oceans Day was first declared as 8 June at the Earth Summit Conference in Rio de Janeiro in 1992 which was attended by all the major wildlife and environmental organisations and government ministers. All around the world marine educational events will be held around this date. In Britain the main events will take place at seaside venues.

There is an opportunity for any small groups to get involved. The British Marine Life Study Society participation to raise public awareness about the oceans includes an Exhibition at Shoreham-by-Sea Library, in Sussex, from 1-12 June 1998. The Exhibition will consist of colour photographs of the sea and marine life, including contributions by local photographers, and information about the sea.

The latest information about the events will be published on the Internet. A link to the official site is contained on the homepage of the British Marine Life Study Society World Wide Web site. The URL is in the box at the foot of this article.

EDUCATION

What fish is it? Too often the student is flummoxed at the first stage. He, or she, is unable to put a name to a fish, crab, or other marine animal. As far I am aware the current school curriculum does not include any advanced taxonomy: the study, description, naming and classification of organisms.

The best advice I can give at the moment is to obtain a good identification guide. Public aquaria can play a useful role in education about the oceans, but too often the information on display is rather sparse. It helps if a colour photograph is on display next to the name of the fish so that the visitor can identify the specimen on display. The scientific name needs to be included as well because the common names can vary.

Would I be asking too much for the scientific names to be included in the best aquarium shops? Perhaps this is not so important because any aquarist worth his salt will buy one of the many excellent books on aquarium fish.

The tropical Butterflyfish, Chelmon rostratus, receiving the attentions of a Cleaner Wrasse, Labroides dimidiatus, at the Horniman's Marine Aquarium & Gardens, Forest Hill, SE London. Entry is free and the small, excellently-maintained aquarium, contains tropical and British aquatic life including a small selection of British sea fish and anemones.

PHOTOGRAPH: ANDY HORTON

BIOLOGICAL RECORDING

The UK Marine Biology Initiative, which I introduced in the January column, has now been renamed Marine Life Information Network (MarLIN). In March 1998 I attended a Conference of the UK Biodiversity Network

This is a very common fish found throughout the year on the shore in the south and west of Britain. But can you identify it?

PHOTOGRAPH: ANDY HORTON

which is the umbrella organisation for all biological recording in the UK. It seems that this important aspect of environmental monitoring has been neglected.

It is really rather important as the records of what lives where there are needed before an area can be assessed for protection and management. In marine habitats the lack of knowledge is even more acute than on land.

Recording the fauna and flora of the seashore and the undersea is a time consuming business. It would not be possible without the help of the many amateur enthusiasts including 'rockpooler' explorers of the shore, and SCUBA divers interested in the varied marine life around the British Isles. If you want to get an idea of what lives in the sea around these islands, a visit to the many public aquaria, or a look at Linda Pitkin's book of colour photographs called *Under Northern Seas* makes a splendid introduction.

MARINE CONSERVATION

So many groups have now taken up their own initiatives to protect the world's wildlife that aquarists may be wary that to support conservation groups may actually endanger the enjoyment of their hobby. The do-gooders may object dogmatically to anybody harvesting the sea for aquarium exhibits. It is well to remember what conservation actually means. It can be defined as 'the planned management of natural resources'.

The first question in wildlife management quickly arises. How can you manage a habitat if you do not know what creatures live there? Hence the need for biological recording to consistent and common standards. This is the quality assessment criterion that presents its own new problems when volunteers participate.

People vary in their ability to identify marine organisms. It would seem some sort of guidance will be needed. All this is being addressed in a series of meetings and seminars, together with lots of other issues like how can the public access the information and what type of computer databases will hold the records?

COASTAL JUNE

Most of all it is good fun to delve around in the pools and rocks when the tide goes out. It is nice to think that in some small way that I can contribute to the pool of knowledge about the natural world. My home aquaria are now full up with a spectacular display of the British sea anemones and a few fish that can avoid the stinging tentacles. This means a visit to the coast is no longer a collecting trip apart from a bucket full of prawns for live food. There is always the chance that I may discover something unusual but for this I will have to venture further afield from Sussex to shores in the south and west.

In June a shingle foreshore can be at its perfumed best when the flowering plants that can resist the effects of the salt spray are in bloom. The Yellow-horned Poppy, the pink of the Thrift, the white flowers of the Sea Campion burst into colour at the end of spring. The season is short and by the beginning of July the display begins to fade.

Down on the foreshore thousands of juvenile Shore Crabs, *Carcinus maenas*, scamper over the sand and rocks, and the first fish fry born this year begin to be seen in the shallows.

The shingle shore above the high tide mark is a special habitat with wild plants like the Sea Kale and Viper's Bugloss, as well as naturalised plants like the Silver Ragwort, that are able to tolerate the salt. It also provides a nesting site for birds like the Ringed Plover. A dedicated marine aquarist would arrange his garden with shingle and seaside plants. PHOTOGRAPH: ANDY HORTON

Andy Horton, on behalf of the British Marine Life Study Society, will help readers who have any difficulties to pursue their interest in the marine life around the British Isles. The first enquiry will be answered free of charge but please enclose a return stamp and do not forget to include your address. Telephone calls should be made during office hours. For more information please write to: Andy Horton, Shore Watch, British Marine Life Study Society, Glaucus House, 14 Corbyn Crescent, Shoreham-by-Sea, Sussex. BN43 6PQ. EMail: bmlss@compuserve.com Web Site: BMLSS (England) URL= http://ourworld.compuserve.com/homepages/BMLSS/BMLSS (Scotland) URL= http://www.ed.ac.uk/~evah01/bmlss.htm The Webmaster for the Scottish site is Alan Pemberton.

LIZ DONLAN'S KOI CALENDAR

The show season is now well under way, having kicked off with the International Koi Show at Milton Keynes. Those readers who know me well will know I have regularly supported shows, either as an exhibitor and/or as a spectator. Unfortunately, I had to miss both the International Koi Show and the Norwich Section Show due to a serious back injury.

Not only do shows give you the opportunity to view some excellent Koi — which you might not normally have the opportunity to see — but they also enable you to see what the various Koi dealers have on offer. There is no doubt that there are numerous bargains at shows, particularly on dry goods such as food, and it is always advisable to stock up for the season if you can.

Additionally, shows provide the opportunity to meet and talk to hundreds (even thousands) of other Koi keepers about every aspect of Koi keeping — whether you discuss the various products on offer or debate the pros and cons of each Koi in the show, you all have something in common.

So the next time you're at a show why not strike up a Koi conversation with the person standing next to you? Yes, I know there's always a chance that the person could be a passer-by but it's still worth a go! Maybe, in this case, your own knowledge will so impress them that they'll take up Koi keeping too.

Despite the above shows also provide a very important showcase for your particular Koi Club and, if you put on a good display, it will certainly help to recruit new members.

SHOW CALENDAR

JUNE

6 Essex Section BKKS. Closed Show, Aveley Sports Ground, Aveley, Essex.

6/7 Worthing & District BKKS. 6th Open Show. Worthing Rugby Ground, Roundstone Lane, Angmering, West Sussex.

13/14 Crouch Valley Section BKKS. Open Show. Barleylands Farm, Billericay, Essex.

13/14 Kennet Valley Section BKKS. Open Show. Donnington Grove Country Club, Newbury, Berkshire.

21 Suffolk & North Essex BKKS. Closed Show. Langham Community Centre & Recreation Ground, nr Colchester, Essex.

27/28 Middlesex & Surrey Border Section BKKS. Open Show. Kempton Park Racecourse. Show Chairman Terry Hill, 0181 397 8471.

JULY

4/5 East Pennine Section BKKS. Open Show (indoors). Japanese Style. The Heritage Centre, Elsecar, nr Barnsley. Information from Sheila Sanderson, 01226740577, or Dave Scriven, 01226 740577.

5 Lower Thameside Open Show. Ford Sports Club, Rush Green, Romford, Essex. Contact M. Wiggett, 01702 342460.

19 Essex Section BKKS. Open Show. Aveley Sports Ground, Aveley, Essex.

19 Plymouth & District. 7th Annual Closed Show at Endsleigh Garden Centre, Ivybridge, South Devon.

26 Mid Staffs Section BKKS. Closed Show at The Hollybush Garden Centre (junction 11, M6), Soareshill, Cannock.

AUGUST

2 Yorkshire Koi Society Show. Harewood House, nr Leeds. Show Manager Mr Glasspole, 01845 526164.

9 Potteries & District. Exhibition at Stapeley Water Gardens, Nantwich, Cheshire.

16 Scottish Section BKKS. Closed Show, 1-4pm, at OKI Ltd., Cumbernauld, Central Region.

22/23 KOI '98 BKKS NATIONAL SHOW. Billing Aquadrome, Northampton.

29/30 Ireland Section BKKS. 6th Open Show. Hillmount Nursery Centre, Belfast. Show Chairman Trevor Geary, 01247 466865.

29/30 West Wales Section BKKS. 6th Annual Closed Show to be within the Llanelli Flower Festival, Peoples Park, Llanelli, Dyfed.

30/31 South East Section BKKS. Open Show, Ravens Wood School, Bromley, Kent. Show Chairman Alan Maskell, 0181 698 5779.

SEPTEMBER

5/6 Birmingham/West Midlands Japanese Style Show. Little Heath Nursery & Aquatics, Burcott.

6 Leicestershire Section BKKS Show. Farm World, Gartree Road, Leicester. Contact Ray Dunkley, 0116 2771600.

12/13 North of England Koi Chapter (ZNA) Open Show. Japanese Style. Arena Sports & Social Club, Sheffield. Contact Yvonne Muse, 0114 2737341 (day) or 0114 289 1437 (evenings).

12/13 Mid-Somerset Section BKKS. Closed Show in conjunction with Countryside Cavalcade, Royal Bath & West Showground, nr Shepton Mallett.

27 Northern Koi Club Open Show. Japanese Style. Cascade Water Gardens, Radcliffe, Manchester. Show Chairman Liz Donlan, 0161 794 8282 (office), 0161 643 9107 (home).

OCTOBER

10/11 Merseyside Section BKKS. Open Show. Venue to be announced.

KOI MEETINGS IN JUNE

3 Leicestershire Section BKKS. Meet at Kirby Muxloe Sports Club. Contact Ray Dunkley, 0116 2771600.

9 Nottingham & District Section BKKS. Corrin Tomlinson. Meet at the Western Club, Hillside, Nottingham. Contact Shirley Hind on 0115 981 0923.

10 Merseyside Section BKKS. Barry Goodwin at The Rocket (a Greenalls inn), at the end of the M62 in Liverpool at 7.45pm. Contact Syd Bennett, 01942 204948.

13 Leicestershire Section BKKS. Pond visit. Contact Ray Dunkley, 0116 2771600.

14 Northern Koi Club. Entertain East Riding Section BKKS. Contact Tony McCann on 0161-794 1958.

21 Leicestershire Section BKKS. Trip to Birmingham Section BKKS. Contact Ray Dunkley, 0116 2771600.

21 Northern Koi Club. St James Hall, Vicarage Lane, off Eccles Old Road, Hope, Salford. Speaking on Water Quality is Peter Haywood. Contact Glynis Morgan-Davies on 01706 218243.

21 Nottingham & District Section BKKS. Meet at the Western Club, Hillside, Nottingham. Contact Shirley Hind on 0115 981 0923.

24 Eastbourne & District Pondkeeping Club. The Lamb Inn, High Street, Old Town, Eastbourne, East Sussex. Koi and Goldfish Spawning — Quiz. Contact Brian Dale, 01323 731369.

There are numerous Koi Clubs/Societies throughout the UK, and we will publish details of their meetings each month as (and when) we receive details. However, could I make one small plea to Publicity Officers — please ensure that you include a contact name and number to be used in conjunction with any Shows or Meetings whose details we may publish.

Copy for Koi Calendar can be sent to me c/o MJ Publications Ltd, 20 High Street, Charing, Nr. Ashford, Kent TN27 0HX, but, if more convenient, Secretaries can also send information direct by telephone on 0161-794 8282 or by fax on 0161-793 9696.

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ASK FOR IT

Back to BASICS

Iggy Tavares, PhD, turns Hatchet Man

PHOTOGRAPHS BY THE AUTHOR USING A PENTAX Z-20 CAMERA

Hatchetfish

One of the more common species of Hatchet, the Marbled.

Hatchetfish are often recommended for the community aquarium to occupy the upper half of the aquarium, while other peaceful species swim in the middle and lower areas

Hatcherfish are a peaceful, shoaling fish which usually keep near the surface of the water. As such they are often recommended for the community aquarium to occupy the upper half of the aquarium, while other peaceful species swim in the middle and lower areas of the tank. I decided to investigate this recommendation by acquiring the two species of Hatchetfish that are commonly available in London.

There are many species of Hatchetfish which sometimes become available to the tropical fish hobbyist. The more common ones include the Marbled Hatchet from Guyana, *Carnegiella strigata fasciata* (Garman) which has heavier black markings. The other Marbled Hatchetfish, *Carnegiella strigata strigata* (Gunther), comes from Peru and tends to have black stripes. Other Carnegiella species are *C. myseri, C. marthae* and *C. schereri*.

There are also species of Silver Hatchetfish, the common one being *Gasteropelicus sternicla* (Linnaeus), with other species, *G. lewis* and *G. maculatus*, rarely being available. The larger Silver Hatchetfish species belong to the Thoracocharax genus. Shops in London sell Hatchetfish by their common name, Marbled or Silver, and hence one does not usually know what species one is purchasing. However, going on descriptions in reference books I acquired a few *Carnegiella strigata fasciata* and *Gasteropelicus sternicla* to add to my community tank.

All the above mentioned Hatchetfish have a laterally compressed, deeply keeled body, which is hatchet-shaped. *Carnegiella strigata fasciata* grows to about 2in while *Gasteropelicus sternicla* can grow to 2.5in. *C. fasciata* is a silver-coloured fish with parallel black markings below the lateral line. Its fins, including the large pair of pectorals, are colourless. *G. sternicla* has a body colour almost like a silver mirror which is only broken by the darker lateral line. Again the huge pectorals and all the other fins are colourless. All the Hatchetfish in the Carnegiella genus do not have the small adipose fin while the Silver Hatchetfish do.

Aquarium set-up

The Hatcherfish were introduced into a well established 30in tank containing other small species such as Cherry Barbs, Black Widow Tetras, Serpae Tetras and Harlequins. The aquarium also had a pair of dwarf cichlids. The aquarium was kept clean by an undergravel filter run by a small powerhead at a low flow rate and partial water changes every few weeks. Plastic

plants were used for decoration, and the water was maintained at 26-28°C.

Behaviour

True to expectations under normal conditions, even in the artificially shallow conditions of the aquarium the different species occupied different areas of the tank. The Hatchets swam as a mixed shoal at the water surface while the Tetras and Barbs usually occupied the middle areas with the cichlids generally at the bottom. This order broke down at feeding time when even the cichlids came to the surface. The Hatchets with their upward facing mouths and compressed bodies are made for feeding at the surface. In the wild they normally feed on insects which fall into the water although there is some debate as to whether they use their strong and long pectoral fins to propel themselves out of the water to catch insects near the water surface. I fed the Hatchets a staple diet of flake which they, and all the other species, thrived on.

Occasionally the fish also got some live food (Daphnia, Mosquito larvae, Whiteworm) but the Hatchets were only able to take Mosquito larvae in a satisfactory manner at the surface. Because of their shape Hatchetfish find midwater feeding difficult and bottom feeding impossible. Wingless fruit-flies are also a good food source for Hatchets but I did not have a culture available.

I was unlucky in that I lost three Hatchetfish in the first week. Initially I thought they had succumbed to some disease and had been eaten by the other residents as I did not find any remains. Only a few days later did I notice the dried up remains of the Hatchets which had jumped out of the tank through a very small gap in the cover. A tight-fitting lid is, therefore, a necessity for Hatchetfish keeping!

Breeding

Breeding is, apparently, very difficult and rare and I must admit that I did not even try. Hatchetfish breeding requires soft, slightly acid water for fertilised eggs to stay viable and hatch. Hatchetfish lay their eggs in floating plants and so this must also be provided.

It is probably best to set up the Hatchets in an aquarium of their own where they can be conditioned with live foods such as fruit flies, other small insects and Mosquito larvae.

Females should grow plumper than males as they fill out with eggs. If and when eggs are laid the parents should be removed because they probably eat their eggs.

The eggs hatch in about two days and when free swimming will take infusoria for a few days before being moved onto powdered flake.

Conclusions

Hatchetfish are a peaceful, shoaling fish which swim near the surface of the water. I found them to be a hardy fish which were quite happy to eat flake food. They usually give the appearance of being a slow fish but they were very fast and difficult to net when I was trying to catch them. Moreover, they are very good jumpers and need a tight-fitting cover on the aquarium to confine them to the water. The other Tetras and small Barbs proved to be ideal companions for the Hatchets. True to form the Hatchets spent all their time at the water surface.

The Silver Hatchetfish.

Fact File

Scientific name: *Carnegiella strigata fasciata* and *Gasteropelecus stenodo*
Common name: Hatchetfish
Distribution: South America
Size: 2 to 3in (5 to 7.5cm) TL

Aquarium Care

Aquarium size: 36x12 x15in (90x30x37.5cm)
Aquarium decoration: Well planted aquarium with some floating plants.
Temperature: 26-28°C.
Water: Soft (pH 7.0, 5°DH approximately).
Diet: Flake, some live or frozen food.

FOCUS ON
FISH
HEALTH

Diseases of Fishes

Robert J. Goldstein, PhD,

surveys the common bacterial fish diseases

PHOTOGRAPHS BY THE AUTHOR

▶ *Capillaria piscicola* is a common nematode of Tetras raised in fish ponds in Florida, where it probably becomes infected by eating an infected crustacean.

Almost all important freshwater and marine aquarium fish diseases are Gram-negative. A few coldwater fish diseases are caused by Gram-positive bacteria, but you won't see them unless you're a salmon or trout farmer. Why is this important? It's important because antibiotics typically are effective on Gram-positive or on Gram-negative bacteria, but not both. For example, the penicillins and erythromycin interfere with cross-linkages of structural molecules of the cell wall of Gram-positive bacteria, but have no effect on the walls of Gram-negative bacteria. And the tetracyclines work on Gram-negative bacteria, but not on Gram-positive species. People get both Gram-negative and Gram-positive infections, so we need a broad array of antibiotics for our own public health. However, tropical aquarium fishes are

mostly infected by Gram-negative bacteria, so penicillins, erythromycins, and similar drugs are next to useless. Let's look at the most common aquarium fish diseases caused by Gram negative bacteria.

Dropsy and Sores

You've seen blood poisoning in fish. A better term is Septicemia, which means infection of the blood stream. In this disease, bacteria spread through the tissues via the blood stream and lymphatic system to many organs, and often shut down the kidneys and other important organs, preventing the fish from maintaining its osmotic balance and causing it to go into shock and die. Symptoms of a general or systemic infection in fish are sores on the body, listlessness, and swelling (Dropsy) which is the accumulation of fluids in the tissues when the fish is no longer able to pump them out through the gills or kidneys. Other symptoms can be localised lesions where the body is wounded from within, develops an ulcer on the surface, then a boil which eventually breaks down leaving an open wound. There can be abscesses inside, in all the organs, including the liver and kidneys. The fish will not survive if the disease progresses this far.

Lots of bacteria can cause these symptoms, but Edwardsiella has been identified as the major cause of mass mortalities in warm-water aquaculture facilities all over the world in both saltwater and in fresh water. *Edwardsiella ictaluri* has been found to cause disease in North American catfishes, Walking Catfish, Danio, and Knifefish, and *E. tarda* has caused disease in Catfish, Carp, Salmon, Flounder, Eel, Bass, Mullet, Tilapia and Yellowtail. Note that these bacteria can affect cichlids, cyprinids, catfishes, and primitive fishes, or just about every major group. There is no doubt that Edwardsiella species affect aquarium fishes as well.

The treatment of choice for this and other Gram-negative bacterial diseases is oxytetracycline in the food. The aquaculture rate is about 3 grams/100 pounds of food, and feeding the fish 1-3 per cent of its body weight per day of medicated food. Purchase medicated feed from a pet store or veterinarian.

Columnaris, Fin Rot and Gill Rot

Fin Rot and Gill Rot, and the related Columnaris Disease, were previously thought to indicate infection with 'myxobacteria', a vague concept. In fact, those 'myxobacteria' have been found to consist of a cluster of species in three genera (Cytophaga, Flexibacter, Flavobacterium) of so-called Yellow Bacteria because they form yellow colonies in culture. These three genera affect coldwater, warm water, freshwater and marine fishes, including Goldfish and Black Mollies. What does it look like? You've had fish hover at the surface, gills flared, mouth open and gasping seemingly for oxygen, even coughing. There may be mucus streaming from the gills. The changes in the gill tissues develop slowly but inexorably and include fusion of the gill epithelium, and swelling of the cells as the fish lose the ability to osmo-regulate. The fish die of suffocation.

The association of these bacteria with fin rot is less clear, and we don't know if they are the cause of fin disease or simply secondary invaders after the fin was damaged by a bite, a nutritional deficiency, or water pollution.

How do you treat this disease? Surprisingly, the treatment is simplicity itself. For freshwater fishes place the fish in a 1-3 per cent sodium chloride dip for one or two minutes. Or, put the

▼ Dropsy in this West African *Aphyosemion* killifish is caused by a Gram-negative bacterial septicemia that slowly shuts down the kidneys and interferes with gill function, so fluids bearing waste products accumulate in the tissues until the fish dies of toxemia.

FOCUS ON

FISH HEALTH

Diseases of Fishes

fish in sea water until it shows signs of distress, but no more than three minutes.

In classic Columnaris Disease, the fins seem to gradually erode down to the nubs, and open sores develop on the body, growing until they penetrate all the way to the body cavity. The causative agent has been called *Chondrococcus columnaris*, *Flexibacter columnaris*, and today, *Cytophaga columnaris*. A marine species causing Columnaris Disease is named *Cytophaga maritimus*.

Columnaris can be treated with medicated foods, or with nitrofurans or copper in the water. Choices abound, but what is most promising is the development of a vaccine consisting of infection with a harmless bacterium (*Cytophaga freundii*) that confers immunity.

▶ *Allencotyles mcintoshi*, a polyophisthocotylean from the gills of a greater amberjack, *Seriola dumerili*, caught off the coast of North Carolina. The dark branching on the sides is part of the reproductive system; head to the left; opisthaptor with clamps to the right.

▶ *Microcotyloides* is a polyophisthocotylean gill fluke removed from a vermilion snapper, *Rhomboplites aurorubens*, in Gulf Stream water, more than 100ft down off the coast of North Carolina. At the lower left you can see tiny clamps ringing the edge of the elongate opisthaptor.

Ulcerative Necrosis

This is worse than it sounds. The genus Vibrio is made up of many species of Gram-negative curved rods, the vast majority of them marine, but a few in fresh water. Two examples are *Vibrio comma*, which causes Cholera in Man, and *Vibrio vulnificus*, which is normally a fish pathogen but which can kill an immuno-deficient person who is scratched or eats raw oysters.

Mostly the cause of marine fish diseases in aquaculture *Vibrio anguillarum*, *V. ordali*, *V. damsela* and several other Vibrios, can form haemorrhagic lesions in the mouth, on the skin, around the eye, or inside within the muscles. The wound on skin looks like it has a black ring around an inner white ring, with a deep hole in the tissue in the centre. Vibrios need iron. They secrete a toxin which causes the blood cells to liquify and then absorb the iron from the tissues and surrounding juices.

Despite the large number of ubiquitous species pathogenicity is uncommon, and is passed to offspring most often via plasmids. It can also be transmitted across species lines by transfer of the plasmids by viruses. The species of Vibrio is less important than whether it carries the plasmid conferring pathogenicity.

The only treatment is a Gram-negative specific antibiotic in the food, but this is difficult to administer because infected fish soon stop eating. Nonetheless, it's worth a try, at least to save all the other fish in the same water. Oxytetracycline, oxolinic acid, and sulphonamides are all effective at times, but the best control is good water quality, avoidance of crowding, quick disposal of fish with these symptoms, and sterilisation of the aquarium if possible.

Haemorrhagic Septicemia

Ulcers in freshwater fishes that look like saltwater Vibrio infections (black and white rim around a necrotic hole) are usually due to *Aeromonas hydrophila*, *A. sobria* and *A. caviae* (Inglis, et al., 1995).

These Gram-negative short rods are motile in culture, swimming with a long flagellum. The bacterium has been isolated from fish, frogs, snails, shrimp, and alligators, and you can bet it's in your fish tank. It is not clear whether the bacterium is a primary cause of disease, a secondary invader, or an opportunist in either case taking advantage of a poorly operating immune system due to parasites, stress, nutritional deficiency, or bad water quality. The symptoms are caused by other bacteria too, especially *Pseudomonas fluorescens*. In all cases caused by this group of bacteria the ulcers are shallow and bright red (bloody), rather than deep and pale (in which the blood cells have been destroyed), as in the Vibrio. Fin Rot in Aeromonas and Pseudomonas infections may have brownish margins, and dropsy may be associated with swimming or hanging sideways near the surface. Most Pseudomonas are harmless freshwater bacteria, and they have an almost identical marine relative, harmless or pathogenic, in the genus Alteromonas.

Medicated Foods (oxytetracycline, nifurpirinol, chloramphenicol) are useful, as is intraperitoneal injection with kanamycin, but antibiotic resistance transmitted by plasmids is very common. Although the bacteria are usually harmless outbreaks of disease occur when a plasmid for pathogenicity is introduced into the bacterial population.

◀ This unusual digenetic trematode has a huge oral sucker and a smaller ventral sucker. Beyond the dark, winding mass of egg-filled uterus lies the testes and ovaries near the narrow rear end.

Focus on ...

AQUARIUM EQUIPMENT

Dave Garratt has a cautionary tale

PHOTOGRAPHS BY A&P LIBRARY

The Seven

This is not really a tale of seven sins committed by marine aquarists, it is more like seven of the worst equipment associated disasters I could imagine.

Electric Shock

The ultimate in equipment failure and guaranteed to permanently part you from your hobby. We all know water and electricity do not mix but in our hobby we exacerbate the situation. We use an even better conductor, ie, salt water, and then actually place a source of electricity, such as the heater, into the water. We top all this off with a nice tangle of wires and so create a recipe for a potential death trap.

There are a number of things we can do to move the balance back towards sanity. Equipment, and in particular, their power leads must be kept in good order and examined on a regular basis.

Cables should not be jointed and wrapped with insulation tape, use multi-socket boards as opposed to multi-plug adaptors, keep cables tidy and short, ensure the power sockets are situated so as to be clear of water spillages.

MOST IMPORTANTLY, use a Residual Circuit Breaker (RCD), a device that is designed to kill the power, in the event of a mishap, before it kills you.

Bear in mind if you have an electrical short and the water becomes live the fish will probably be swimming around looking OK. It will only be when you provide a route to earth by putting your hand in the tank that the 'bolt from the blue' will occur. Personally, I will not set up a tank that is not protected by a RCD, and even go the length of carrying a plug in RCD with me when I am asked to do some work on someone else's tank.

Tank Breakage

A friend and fellow club member came home from work to find his 6in Emperor Angel on the floor of the hallway. In a state of increasing alarm he then followed a trail of fish strewn carpets towards his tank.

The front glass had completely shattered. To cut a long story short it transpired that the tank manufacturer had used reclaimed shop window glass for his tanks.

In hindsight my distraught friend admitted it was a big mistake using an unknown source whose main business was not tank manufacture.

We all want more money to spend on livestock but the tank is not the place to start your cost cutting.

I know of others who have discovered to their cost that tank construction is a job for the professional, a point that can be further illustrated with tales of home built filter systems constructed in toxic plastics.

Deadly Sins

Heater/Stats

A thermostat that sticks and leaves the heater on will eventually raise the water temperature to a lethal level. If the heater fails the water will eventually cool with similar lethal results. The time taken to reach critical limits will depend on the size of the heater compared to the tank and the tanks external environment. Any problem should be noticed quickly enough if a daily temperature check is carried out and a spare heater/stat is always kept available. However, the problem can be severe if you are away from home overnight, or much worse if you are away on holiday.

A large heater in a small tank could quickly overheat the water to a critical level, a fact that provides a sound argument for using undersized heaters. A 200 watt heater in a large (for example 200 gallon) tank, whilst taking a long time to initially reach the desired temperature when setting up the tank, will easily maintain the temperature once reached. Heater size requirement is often quoted as a minimum of 2 watts per gallon thus suggesting 400 watts for a 200 gallon tank. Such a figure in today's centrally-heated settings is generally unnecessary and would overheat a tank twice as quickly as a 200 watt version in the event of a failure.

Protection against a temperature drop in the event of a heater failure may be a wise precaution in a colder setting or for holiday periods. It could be achieved by using two heater stats, the second one being set at a lower temperature and, thereby, only being activated if the primary heater fails and the tank temperature drops.

Tank Leakages

Many of today's reef aquaria rely on external filtration systems requiring drilled tanks and external pipework. Whilst enthusiastic hobbyists do successfully construct their own systems, drilling holes in glass and achieving leak proof seals is not usually a good idea for most amateurs. Small leakages may not cause any loss of livestock but I can guarantee they will cause you a tremendous amount of hassle. However, if a major seal came adrift the consequences could be serious for the fish, tank electrics, carpets and probably your own sanity.

Similar results can occur if the return tube on a power filter comes adrift. Ensure all connections are sound and check them on a regular basis. Placing the intake of the power filter towards the top of the tank will ensure the tank is not almost totally emptied in the event of the return tube coming adrift.

Air Pumps

Air pumps return us to the problem of toxicity. The air pump is going to pump the air immediately surrounding it into the tank. This is fine in most cases where the air pump is close to the tank as presumably the tank will have been sited so as to avoid any potential contamination problems.

However, if the air pump is remote, perhaps in a garage or a work room, the air may well be less than perfect depending on what is being done in the room at the time. Similar caution is

▲ FAR LEFT
Use a cable tidy for neat and safe electrical connections.

CENTRE
Waterproof connectors for fluorescent tubes will stop dampness through condensation causing problems.

RIGHT
Be safe rather than sorry — fit a Residual Current Device.

Focus on ...

AQUARIUM EQUIPMENT

The Seven Deadly Sins

needed during redecorating, particularly if stains, varnishes or brush cleaners are being used.

Water Splashes and Lights

Obviously water and hot lights are not an ideal combination. All lights emit heat and become hot during use, in particular spotlights or specialised lights such as mercury vapour. All these lights have various chemical coatings on their inside glass surfaces. If lights are splashed they can explode showering you with glass and, if the cover glasses are not in place, their chemical contents will fall into the tank.

Always ensure you have the recommended distance between the light source and the water surface. Keep the cover glasses in place when you are not working in the tank and position the lights in a safe position when you are.

Over Optimism

Today's modern equipment will only achieve what it was designed for; for example, do not expect ultra-violet or ozone to guarantee a disease free tank. Both will contribute to the overall health of the tank but you should not become lulled into a false sense of security.

Remember that equipment needs maintenance. Protein skimmers are tremendously efficient aids to filtration but they require careful maintenance to ensure optimum efficiency.

Flow rates are crucial to filtration systems, therefore ensure you work to flow rates that are quoted when the filter is under load as opposed to when the filter is running empty.

Conclusion

Advances in equipment design have made life easier for us whilst removing some of the chores that we were required to perform in the past. Technological advances have brought capabilities that earlier aquarists could only have dreamed of. Equipment used correctly and wisely should provide reliable service and help us to achieve ideal conditions in our tanks. With a little knowledge and a few precautions the seven deadly sins can be avoided.

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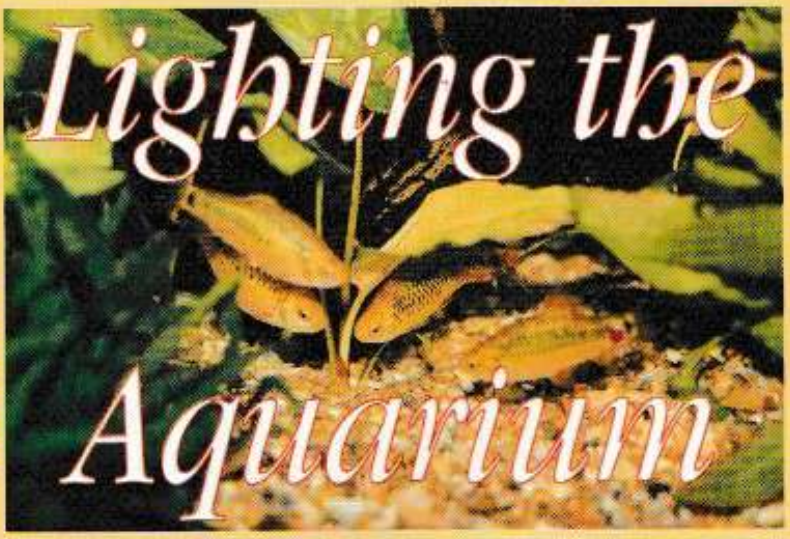
Lighting the Aquarium



Focus on ...
AQUARIUM EQUIPMENT

Dick Mills provides some light reading

PHOTOGRAPH BY A&P LIBRARY

If you were looking for lighting ideas, rather than buying fish, where do you start? A light that flatters your fishes' colours? One that replicates the intense lighting of the coral reef? One that makes the plants grow? Lamps built into the reflector/hood or high-tech pendant lighting?

The Reason for Light

Without light nothing would function to its natural potential. Light (and its equal and opposite, darkness) brings rhythm into our lives and simply just providing us with the means to see things seems almost by the way.

Aquarium Uses for Light

Being our usual selfish selves we want to see the contents of our tanks! How we see them is a matter for our own individual tastes, of course — some like it bright, some prefer it dimmer, some want it gaudy. Generally, every aquarium with a supplied reflector/hood comes enough light to provide us with a viewing light and not much more.

Turning to the fish next, they are responsive to light and many have light sensitive cells in the dorsal surfaces or around the head. They are certainly affected by the direction from which light comes too; try allowing light to strike the aquarium from a different source than normal: after a time the fish will be leaning over to ensure that the light falls fully on to their dorsal surfaces. Again, when hatching Brine Shrimp, shading most of the hatcher will make the hatched Shrimps congregate in the lighted area for easier collection.

However, light is not necessarily mandatory for the fish to go about its daily business for it uses other senses equally well. The lateral line's nervous, or sensory, system helps to navigate efficiently in turbid and murky waters, whilst taste cells on the body or fins assist in the location of food. But light must be important, otherwise the purposes of colours and patterns would be all to no avail.

Probably the life-forms to derive the most 'use' from light are the aquatic plants which we depend on to provide 'water cleansing' services for us. As if this were not enough, plants also provide shelter, spawning sites and, in some instances, food for the fish — quite a bargain when you think that all it costs you is the price of a few units of electricity per day!

Providing the Right Amount

So, if the basic aquarium only comes with enough light fittings for viewing purposes, do we need more lighting as a matter of course? It depends on what fish you keep. If you have fishes' main objective in life is to eat anything that's green immediately it pokes its head above gravel level then adding more light is not worth considering.

Use replica plants, which will add decoration but won't be destroyed by the fish — however, you will have to find some way of satisfying the fishes' herbivorous demands by other means.

Generally, doubling the amount of light is a good start to encourage vigorous plant growth but do make sure you have enough plants in the tank to take up all this extra energy otherwise all you'll get is algae!

For extra light energy, without buying more lamps, make sure that all that's generated by the

Focus on ...

AQUARIUM EQUIPMENT

Lighting the Aquarium

lamp is used efficiently: a clip-on reflector gets more light down into the water — and don't forget to keep those cover-glasses clean as well as maintaining your filters to ensure crystal-clear water too.

To encourage macro-algae in marine tanks requires quite an intensity of light, as does the symbiotic algae living within invertebrates. It may be that a further doubling of light may be required.

Controlling the Light

Many freshwater plants may well have differing demands as to the length of time they need light. The difference in photo-period between different genera of plants is often overlooked when attempting to create a 'community collection' of plants — which we probably chose for their looks anyway! The colour of the plant also gives a clue to its light requirements: those having a reddish hue — *Rotala*, for instance — need intense lighting as do many of the fine leaved varieties, which calls for very precise 'light-dosing' in order to get the plant growing well, without being choked with algae.

Generally, the aquarist should be able to arrive at the right amount of lighting to suit the aquarium (and domestic) needs through trial and error. Too much will lead to algae problems but using floating plants to shade out the light and growing more shade loving species beneath tall-growing species is a more natural way than constantly tinkering with lamp intensities and time-switches.

Types of Lamps

It is now the norm for fluorescent tubes to be supplied with the necessary starting gear and the lamp itself fitted behind a splash- or waterproof housing in the hood.

With a wide range of different light spectrum tubes on the market it is quite feasible for the hobbyist to 'mix 'n match' tubes to give precisely the lighting effect needed. Things all fluorescent tubes have in common is evenness of light spread, relatively cool (and, therefore, economic) running and generally long-life.

Where a more intense amount of light is not possible with fluorescents, other types of lamps must be used. The metal-halide, mercury vapour discharge lamps are all suitable. Like fluorescent tubes these lamps require some form of 'starter gear' which may be built into the lamp fitting or housed remotely. Hanging pendant lights obviously require direct 'line of sight' to the water surface, unencumbered by a reflector/hood; unless the water surface is some distance away from these 'hot' lamps, a cover glass is mandatory!

Another problem comes when deep water tanks are used: in this situation the light levels decrease rapidly with increasing water depth and light-loving plants or symbiotic algae may be starved of their vital energy-source unless suitably powerful lamps are installed. Here, we come across another paradox: that beautiful covering of lawn-like plants we want to cover the aquarium substrate is usually made up of plants which need the most light — right where we find difficulties in providing it!

May The Light Be With You!

So now you've got the correct intensity of light for the correct length of time you must take action to maintain the status quo: lamps do wear out and many fluorescent tubes emit only a fraction of their original output after, say, a year's use. Short of continually using a submersible light meter to check on your lamps' efficiency it is best to regularly change the lamps at certain predetermined periods — if you wait for your own eyes to tell you things are getting dim it's far too late!

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Derek Lambert finds not only fish but also Fire Ants!

PHOTOGRAPHS BY THE AUTHOR

The A&P Costa Rican Quest

Rio Sixola.

We arrived in Limon on 14 February, just as it was becoming dark. Dave McAllister had recommended the Hotel Maribu Caribe just outside of the city. Perched upon a hill top it has some beautiful views along the coastline which were absolutely stunning and the rooms are spread throughout the grounds in little bungalows. A beautiful place which was to be our base for the next four nights.

The next morning we headed straight down the road to Moin Docks. This was only some 10 minutes from the hotel but it was one of the areas Dave had said *Brachyraphis hoidridgei* came from and this was one of the fish I was particularly interested in. The captive stocks at this time were becoming very thin on the ground and a fresh collection could only improve the situation. Dave had already told us that the pond where he originally collected this species had disappeared but Arthur and I were hopeful we would find other locations with this fish in. As it turned out a ditch just the other side of the road to the original location had both water and plenty of fish in it.

> Perched upon a hill top just outside Limon our hotel offered some beautiful views along the coastline

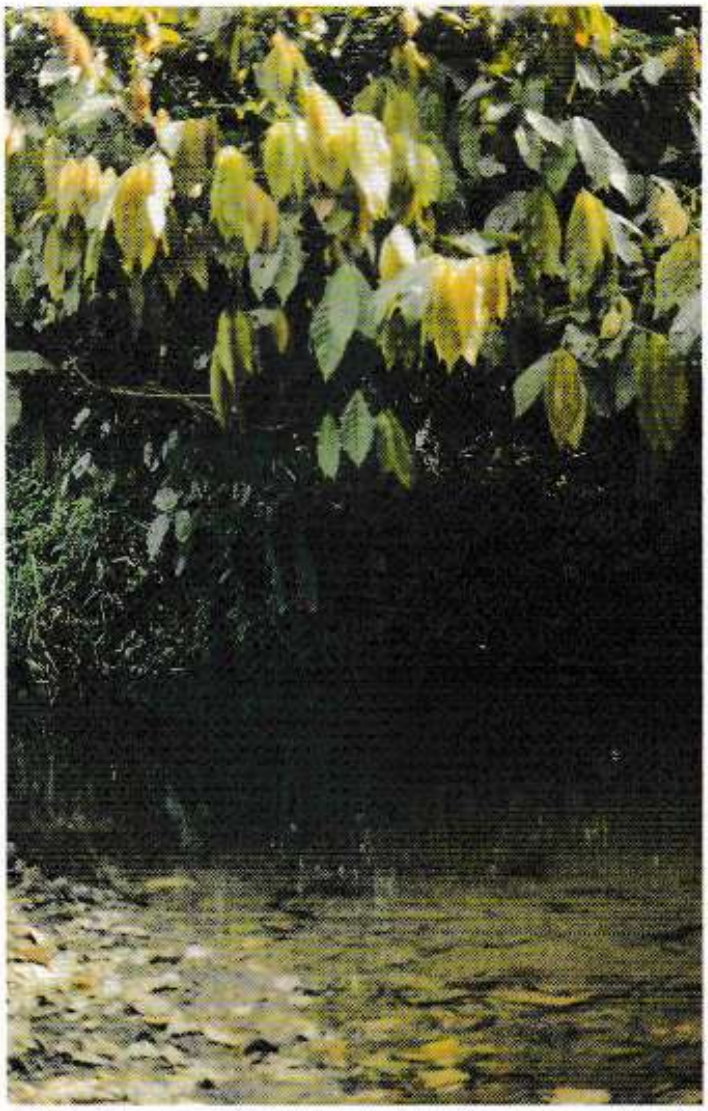
Mission accomplished

Here we caught several different species of Cichlid, the ever-present *Astyanax*, *Poecilia gillii*, *Alfaro cultratus* and a few small *Brachyraphis holdridgei*. Mission accomplished we headed back to the hotel for some breakfast and then jumped back in the car for a drive down towards the border with Panama. The further we went the worse the roads became until we were finally on a 'road' more dirt than pavement and with potholes deep enough for a car to almost disappear in. These were the sort of conditions we had hired a four wheel drive car for and despite being thrown from pillar to post we had great fun getting around.

THE A&P COSTA RICAN QUEST ... finding fish and Fire Ants!

Our main location in this area was the Rio Estrella. This was a lovely stream flowing through the jungle with deep pools and lots of shallows. Here we found just a few *Priapichthys annecters*, plenty of *Alfaro cultratus*, some large *Poecilia gillii*, *Astyanax* characins and some lovely Rainbowfish — *Atherinella* sp. We also caught some Cichlids which Arthur was sure of the identification of, *Cichlasoma (Archocentrus) septemfasciatum*. This is one of the smaller (4in) Central American Cichlids and is found along the Atlantic slope of Nicaragua down to the Rio Sixaola basin which is the boundary between Panama and Costa Rica. They spawn in the quieter parts of pools where they can protect their fry from predators.

Luckily, however, they were not too successful when it came to protecting their fry from my net and we had a group of about 20 fry to take home with us. Once again we had spent a long time at this location but we thought we could manage a short stop at one more place and, hopefully, find a collectable population of *Priapichthys annecters*. The few we found here were not enough to risk the journey home so we returned them to the river.



Rio Estrella.

Another surprise encounter

The river we found was fairly small but with a good flow of water. It was located 2km west of Puerto Viejo. Here we caught not just the *Astyanax* which you find all over this part of the world but also a *Brycon* sp. which grows to over 6in in length. Another surprise was an *Eleotris* sp. At both this and the previous location we tested the water and found it to have a pH 7.8, GH5 and KH7, rather alkaline by Costa Rican standards. By now evening was drawing in and we still had a long drive back to the hotel. We thought with luck we should make before it became too dark. About half an hour down the road, however, we hit a checkpoint where the Costa Rican home guard were searching every vehicle (not surprising when you remember that beyond this point are only a few villages, and Panama). We were a little nervous as they opened up the back and found lots of fish.

As it turned out the guard just looked totally mystified and after making sure they were not a front for drugs and the such like, told us we could drive on. We arrived back long after nightfall and had to drive the full length of Limon to reach our hotel. Whilst not the worst drive through a city

we had ever had it was still not a good experience.

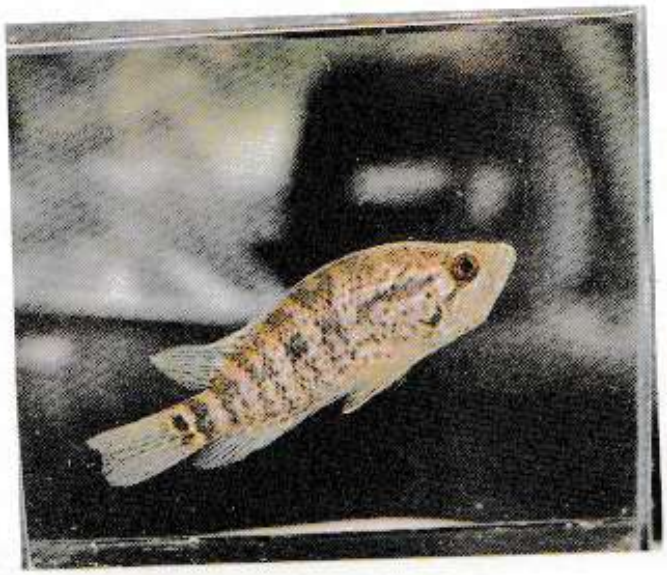
Finally hit the jackpot

The next day we had one more sortie into this area to try to find a location for *Priapichthys annectens*. Those of you who read the last part of this series will remember that the very first location we fished had produced a good number of these lovely animals but we returned them because the southern race was supposed to be more attractive. Since then we had only found the odd one or two — certainly not enough to bring back a foundation stock and I was becoming a little concerned. After trying at a number of different locations we finally hit the jackpot at the Rio Cataratas. Here the river flows over a high water fall but above this we found lots of them in shaded pools living in exactly the same sort of habitat as we found them in way to the north. The orange in their fins was truly beautiful and they were the perfect size to take home. We also found *Poecilia gillii*, *Atherinella* sp. and two different species of freshwater shrimps and had one of our large nets stolen by the local children.

Fortunately it was not one of the most useful ones so it did not cause us any problems. The water tests at this location came up with pH 7.5, GH6 and KH5.

Our final day in this area was spent searching rivers to the north of Limon. A number of different rivers and streams were sampled but one in particular stands out in both our minds. To reach this particular location we had turned off the main highway and headed towards the coast looking for a tributary of the Rio Reventazon. After meandering around the back lanes through some lovely countryside we found a quebrada (small river or stream) which flowed out of some jungle under the road and across a farmers field. Here we parked the car and decided to try our luck.

Things did not get off to a good start because as I stepped out of the car I put my foot right on a Fire Ant's nest. These nasty beasts are named because when they attack you it feels like your skin is on fire. A quick dash down to the stream



One of the Cichlid sp.

Brachyrhaphis holdridgei.

and I managed to wash the worst of the poison and ants off. Now I headed into the jungle with nets and buckets in hand. Spider's webs abounded and lots of rustling in the undergrowth proved I had plenty of company.

Astyanax present, as usual

Once I found a suitable pool I started to fish and promptly forgot all about the other wildlife. As usual *Astyanax* were present in the deeper pools, so too were *Alfaro cultratus*, *Rhoilichthys pitteri*, *Poecilia gilli*, *Xenophallus umbratilus*, *Priapichthys annectens* and some shrimps. I knew there were some cichlids present as well because I had disturbed them when I jumped in to wash my foot off but in this area I didn't catch any.

Arthur, however, did not follow me into the forest but found a little pool no more than 3ft across and 2ft front to back. Here he made one sweep with a large dip-net and pulled out lots of Cichlids. In fact four different species came out of that one pool plus a single specimen of *Poecilia gilli*. Three of the four species we could identify on site. The commonest were Convict Cichlids, *Cichlasoma* (*Archocentrus*) *nigrofasciatum*, with lovely gold patches on them. Then we had a single large specimen of the Wolf Cichlid, *Cichlasoma* (*Nandopsis*) *dovii*. This one calmly ate the *Poecilia gilli* whilst my back was turned! The other species which we could identify was *Cichlasoma* (*Amphilophus*) *alfari* which was a real find for Arthur. What we found so amazing was all these fish came out of such a small pool. The same species occurred in the main river as well, once Arthur could drag himself away from the pool and start fishing in the open areas but he never found so many fish in such a small area. When we tested the water at this location we found a much higher pH than we had before, 8.5 which is very alkaline. The hardness, however, was still only GH6 and KH6 which is soft. A very odd mix to be sure.

After spending several hours at this one location we realised it was time to head back to the hotel. After packing all the gear we turned round and headed back towards the main road. Just by some houses, however, we were stopped by a huge Goose. It was a lovely male Canadian Goose which had no intention of letting us go past him. In the end I had to jump out of the car and try to chase him out of the way. That was when I found out he had a wife sitting on a nest right where I had got out of the car. She honked and hissed at me until I moved well clear of her home. Eventually I managed to shoo the male out of our way and we could move on.

THE A&P COSTA RICAN QUEST ... finding fish and Fire Ants!

Troubles come in threes

They say troubles come in threes and after the ants and geese I suppose I should have been ready for another problem with an animal. This one came in the form of an insect which had buried its head in the fleshy part of my leg and was happily munching on me. In the end I broke most of its obnoxious body off before the head could be dug out. Even now I shudder to think of it. Still no infection set in and it did not irritate me after it was removed.

Back at the hotel we packed all our gear up and made ready for an early start the next morning. This day we had a long drive from Limon over the mountains to San Isidro del General on the Pacific coast. This was to be our final base in Costa Rica before returning to San Jose. Both Dave MacAllister and Dan Fromm had recommended the Motel Del Sur in this area which was going to be our base for the last few days. Dave had stayed at this hotel five times whilst searching for *Brachyraphis terrabensis* and had only once found a few small fry of this species. Arthur and I hoped to be more successful.

Rio Reventazon.

BUY LINES

NEW PRODUCT REVIEW

NISHIKLAY

A new calcium montmorillonite clay topical additive is introduced for Koi keepers this month from WCF Ltd. Montmorillonite clay has been widely used in Japan for many years to improve Koi health and skin lustre by effectively remineralising the pond environment.

The beneficial mineral content in an enclosed pond system is soon depleted, the reintroduction of the correct balance of minerals will restore the beneficial water quality characteristics required to help maintain Koi in a very healthy environment.

Nishiklay will also provide better water clarity and, through the absorption of the minerals, better skin lustre and growth potential.

Product confidence is critical for pond owners who may be considering trying something 'new'; WCF have launched this product after years of testing and research and are currently funding further trials at a leading university to establish further potential benefits of their high-purity clay.

WCF also supply speciality products and a full range of Koi medications to Koi enthusiasts.

• WCF are happy to 'talk Koi' with all their fellow enthusiasts and can be contacted at: WCF Ltd., Unit 4, The Station Business Park, Teignmouth, Devon TQ14 8QJ. Tel: 01626 879000. Fax: 01626 777341.

UNDERWORLD

Enter the Barley Ball, the Advanced Algal Control System for Garden Ponds distributed by Underworld Products. The Barley Ball is a highly effective, environmentally-safe treatment for the control of unsightly Blanketweed and the algae that cause green water problems in garden ponds.

Containing pre-activated barley straw and a float seeded with natural micro organisms the Barley Ball releases powerful, natural (but completely safe for fish, pets and flowering plants) algal inhibitors for a full growing season. The unique design suspends the active ingredients just below the water surface, where the anti-algal activity is maximised.

In time the Barley Ball will become colonised by beneficial aquatic insects and crustaceans, helping to supplement the supply of natural food for your fish. While immediate improvement in water clarity may be noticed, it may take two to four weeks while the breakdown process gets under way.

Designed for ponds containing 220-2,200 gallons (1,000-10,000 litres) the Barley Ball should not be used in ponds smaller than this. Multiple units can be used in larger ponds. The spherical 'ball' should be removed, cleaned and stored over-winter to be reactivated year after year with a refill available from your original supplier.

Underworld Products are also distributing the new AmmoEx water conditioner. This conditioner will remove Ammonia, Chlorine and Chloramine from both fresh and saltwater. It is most suitable for use in new, unconditioned aquariums, heavily stocked tanks or those that are undergoing treatment.

• Further details of both products available from: Underworld Products, Units 1 & 2, Belton Road West, Loughborough, Leics LE11 5TR. Tel: 01509 610310. Fax: 01509 610304.

KING BRITISH

OK, so summer's on its way — I think I can give you a definite 'maybe' on that — and with it will come that usual perennial pest, the housefly. Faced with the knowledge that using fly sprays near to aquariums put fishes' health at risk King British found the answer to controlling flying insects with their new product, a 'safe near aquariums' flypaper.

The non-toxic, easy-to-use papers are both safe and effective, more so than keeping Archer Fish, leaving the hood off and hoping for the best!

The comprehensive range of King British Aquarium Treatments (all 13 of them) now have high impact, visual appeal that makes them stand out on the dealer's shelf. Each is colour-coded for easy identification. As an extra safeguard all treatments feature child-resistant caps.

In every retail pack there is a free Fish Health Care Guide.

Also benefiting from new packaging and presentation are the Weekend Feeder and Holiday Block tablet foods which now colour coordinate with other King British Fish Foods and Water Treatments.

Those hobbyists keeping turtles and terrapins can now give their pets a complete range of products especially designed for them. Exclusively from King British comes Turtle and Terrapin Food, Water Freshener and Conditioning Block.

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Also found in consumer research nine out of 10 fishkeepers who tried Pond Pride Fish Foods said they would continue to use them in preference to any other. To introduce more fishkeepers to this premium brand Pond Pride is launching a money-back offer

• Further detail of all King British products from: Sinclair Animal and Household Care Ltd., Ropery Road, Gainsborough, Lincolnshire DN21 2QB. Tel: 01427 810231. Fax: 01427 810837.

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NEW PRODUCT REVIEW

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Pond owners want to enjoy the tranquil delights of their healthy plants, fish and animals in clear bright water. Too often the dream, the result of so much planning and hard work, is spoilt by green water or Blanketweed, common forms of algae.

Maintaining a balance of plant and animal life in the pond and providing shade will help to control the growth of algae, but it can still become a serious problem, spoiling the appearance of the pond and, in some cases, becoming a health risk to fish and other pond life.

Chemicals have been available for many years to help deal with the problems of green water and Blanketweeds. With growing public concern over all aspects of the use of chemicals, however, there is a strong demand for an environmentally friendly alternative.

Barley Straw has been used for hundreds of years on its own, to combat algae in ponds, but the technique was little understood and was not widely accepted.

Following years of research at the Centre for Aquatic Plant Management (an out-station of the Institute for Arable Crop Research, Long Ashton), Green Ways introduced an improved Barley Straw treatment in the form of Pond Pads for use in garden ponds. Green Ways Pond Pads were featured on BBC *Gardeners' World* in 1994 and again in July 1996.

• Further information from: Green Ways, Southend Farm, Long reach, Oddham, Woking, Surrey GU23 6PF. Tel: 01483 281391. Fax: 01483 281392.

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Meet the Societies

THE GOLDFISH SOCIETY OF GREAT BRITAIN

In August 1947 the Aquarist Magazine as it was then known announced that one Captain L. C. Betts proposed the formation of a new specialist Society for coldwater fish. So it was that on 16 April 1948 the very first meeting was held of the newly-formed Goldfish Society in London at which 23 prospective members attended. Some 50 years later the Society now has over 100 members worldwide.

The Society is managed by an elected Committee, one-third of which is elected annually. Six Bulletins a year are produced for members in which ideas can be passed on, to one another, knowledge gained passed on, questions asked — with the hope that someone will answer them — and, above all, to keep each member in touch with the Society.

The Society has, within its membership, a wealth of knowledge and experience which is freely available to members, either by attendance at its Meetings or via the Bulletin. With such information gained over the years various publications have been produced by the Society.

Five meetings a year take place in London, on the third Saturdays of January, March, May, July and November. The next meeting will be on18 July at the London YMCA, Errol Street, Barbican, London EC1 at 2.30pm, where members will be listening to 'The Pitfalls of Judging Good Quality Goldfish', with examples of Goldfish to demonstrate.

The month of October is reserved for the Society's Open Annual Show (this year on 3 October. This is an all-day event which incorporates the now famous Auction of over 100 tanks of members' surplus stock of good quality Fancy Goldfish.

More details can be obtained by sending a SAE to: The Membership Secretary, Roger Saltrick, 38 Herent Drive, Clayhall, Ilford, Essex IG5 0HT. Tel: 0181-550 1252.

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50 Years Ago ...

As recounted by Editor **Dick Mills**

In the period immediately after the war the increase of interest in all things aquatic was rapid. Looking through past issues of *A&P* makes interesting reading not only for the diversity of subjects raised but for the apparent enthusiasm by all contributors whether they be authors, reporters from Societies or letters from readers. June 1948 threw up this selection of topics ...

Although the importance of the educational force of the aquarium has been long emphasised its therapeutic calming value had been mentioned less often way back in 1948. But the June issue of *A&P* soon put things right. In an Editorial entirely devoted to this aspect the following story from the *Romford Recorder* (shortened here for space reasons) did much to redress the balance:

"It all began when Benhurst A.S. presented the Children's Ward at Oldchurch Hospital in Romford with a fully equipped tropical aquarium completely with gaily coloured fish, sand, rocks, and all the paraphernalia which is normally put into such a tank, to make them as realistic and attractive as possible. It provided a bright spot in their lives, something to gaze and wonder at; and something to pass the time. It was during the installation and subsequent maintenance of the aquarium by the Society's members that the particular interest of Lilian Hammond was noticed. She became so engrossed with watching the antics of the agile fish that the Secretary of the Society decided to provide her with a tank specially for herself. She was thrilled. It had an important practical value. During the long months of her illness Lillian's doctors had tried in vain to induce movement into her helpless limbs; when the little aquarium arrived beside her bed she could only look at it by turning herself over. Her continued efforts to turn and gaze at the elegant fish in her own beloved dreamland accomplished something that the doctors patience had never been quite able to do."

But the story didn't end there. "Lilian is now planning to visit the Society's Secretary to see his large collection and, as the Ward Sister promised, in the near future when she will be taken in a taxi to visit the Society at Elm Park. In the meantime she has accepted an honorary membership of the Society and says how, by the hour, she rests and gazes at her own little fish chasing each other.

A visit to Paris was recommended by L. C. Mandeville, who had reported very favourably on the aquatic collections at the Trocadero, the Jardin des Plantes and the France Overseas Museum next to the Zoological Gardens at Vincennes. He also discovered that French aquarists were heavy users of bloodworm, to be found in most pet shops; not only that, door-to-door deliveries of *Daphnia* were regularly arranged. Another bizarre finding was that due to the Metro underground system compressed air supply pipes often accompanied those for gas and water, so the French fishkeeper could, theoretically, have instant aeration on 'tap' without resorting to air pumps.

Practical, almost instant, ready-to-use, impromptu ponds for spawning, quarantine or hospital quarters use, was brought to the notice of readers. Bear in mind this was during the period immediately post-war, and you shouldn't be surprised that these items were very much war surplus, consisting of inflatable RAF rescue dinghies!

Nowadays, as then, most people are aware of the eel's reproductive cycle. However, for centuries before the truth was known, there were some rather bizarre explanations how young eels came about. Aristotle asserted that because no eels had been found with milt or roe, therefore, they had no reproductive organs. Then, Pliny the Elder suggested eels rubbed themselves against rocks and that any flesh torn off became youngsters. Romans considered Jupiter and the Goddess Anguilla were the parents of the fish. Even in 1948, apparently, there were a few people who believed that soaking horse-hairs in water for around nine days had the same result. The most quaintest must be the German zoologist who maintained that the dews of May mornings gave birth to eels.

Aquatic advertisers, then as now, lost no opportunity to attract attention to their wares and services.

One reads: "Now the petrol is back, visit the Torpoint Aquatic Supplies Showrooms at Alma Road, Plymouth."

Another began: "Will Mr Brocklebank let me have his address? His second letter, with order, had no address therein. The first was destroyed as it was only an enquiry. We want to get his order off."

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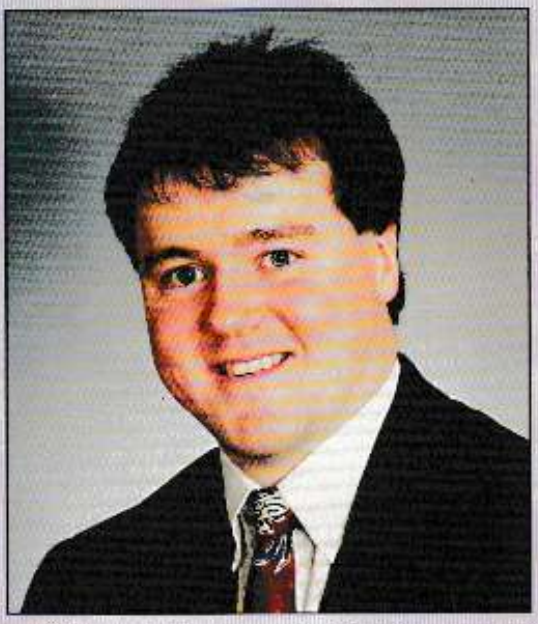

A&P meets the faces behind the names and lets them tell you of their own individual aquatic interests.

This Month: *ROGER FOGGITT*

A&P: How long have you been in fishkeeping and what started you off?

RF: For about 15 years. My interest was really started through my hobby of scuba diving which began in the Isle of Man. I could see fish in their natural environment and thought why not try and reproduce it in an aquarium.

A&P: Can you remember your first aquarium and what you kept in it?

RF: My first fishkeeping experience started many years ago with the traditional goldfish won from a fair but my first real attempt was when I rescued a goldfish and attempted to keep it with some other coldwater fish like trout in an aquarium! This wasn't particulary successful back then but that's another story and I certainly wouldn't recommend it to anyone now!

A&P: What are your special interests?

RF: I suppose if I have a special interest then it has to be keeping marine fish although my job lets me keep my interests open across all aspects of fishkeeping.

A&P: Are you interested in breeding fish?

RF: Although I have had 'random' breeding happen in aquariums which I have kept and have grown the resulting fry on I have never actually really had the space or the time to really give it the dedication which it requires to make a proper job of it.

A&P: Do you belong to any Aquatic Society.

RF: I do not belong to any individual society although I am an honorary member of the West Yorkshire Marine Aquarists Group. That said, though, because I am often invited to talk to many societies around the country and spend a lot of my time talking to fishkeepings I do feel that I am part of what could be best described as the 'global fishkeeping society.'

A&P: What do you think about Fish Shows?

RF: I think that the traditional system of showing fish in small individual aquariums is now a little outdated. We all talk about water quality, filtration and the 'correct way' of keeping fish which is not shown to its best advantage by showing them in small cramped show tanks. From the many shows which I have now seen around the UK I think that by far the best way of displaying and promoting fishkeeping is to go along the lines of furnished and landscaped aquaria which always generate massive amounts of interest at the shows.

A&P: If money was no object what aspect of the hobby would you like to follow?

RF: If money was no object I would love to set up what I class as the ultimate biotypic marine system with a series of large aquaria linked together incorporating as natural a system as possible. Each individual tank would incorporate each individual part of the marine ecosystem such as the reef lagoon, reef wall, open water, etc. This would allow the whole system to incorporate all the different aspects of filtration, etc, of the live marine ecosystem such as algal turf scrubbing, nitrification, denitrification, and so on. It would definitely cost some money, though, so I can only dream!

A&P: What fish would you never keep and why?

RF: The only fish I would not keep are ones which there really have never been any successes with and those which really grow far too large to be kept in a 'normal household' sized aquarium. It upsets me to take phone calls at the Fishkeeping Information Centre from people who are despetate to get rid of a fish which has grown too large for them to keep as often there is nowhere that these can be rehomed.

A&P: What's your favourite aquarium book?

RF: I don't really have a favourite. However, I suppose that my three most prized books are *Dynamic Aquaria*, by Adey and Loveland, *Fish Medicine*, by Stoskopf, and *Seawater Aquariums — The Captive Environment*, by Spotte. If I were to recommend a good beginner's book for the aquarist then I would go for the *Manual of Fish Health*, by Andrews, Exell and Carrington.

A&P: How do you think fishkeeping is keeping up with other modern day attractions?

RF: Quite well. In muc of the national and local press recently there has been much discussion on keeping fish, especially goldfish. Latest figures show that the goldfish is the third most popular pet in Britain which must show that the interest in fishkeeping is growing. There does seem to be a levelling off of those people keeping tropical fish, though, and this may well be due to other hobbies now becoming more popular.

A&P: What do you get from fishkeeping that keeps you interested?

RF: The hobby that we have is almost infinitesimal in size and there is no avenue that you cannot turn down. I do not think that there is anyone who can claim that they have managed to keep and successfully breed (or even find and classify) all the individual fish and invertebrate species in the world so there is always something new to try. Ask anybody with a fish house and they will tell you that there is NEVER enough room to keep all the fish they would like!

A&P: What's next in your fishkeeping plans?

RF: I am one of those people who never stops moving things around in the aquarium and who continuously tries new layouts, filtration systems, etc, to make life easier for myself and more stable for the inhabitants. I suppose then that my current 'reef wall' marine system is almost due for a few changes to be made to it which will give me a bit more room for some of the soft corals which have grown so well that they need a bit more room creating for them before they begin to pop their heads out of the water. After that — who knows — that's what makes this hobby so fascinating!

SOCIETY WORLD

Interpet renews sponsorship

Paul Corbett, FBAS Trophy & Brooch Officer, reports that Interpet have generally agreed to continue their sponsorship of Federation of British Aquatic Societies' Trophy Awards into the next millennium — from now to 2001. The sponsorship covers the British Open Fish Competition, the Supreme Championship (including all qualifying championship classes at FBAS Open Shows and the final at Weston) and Best in Show Awards.

Full details of FBAS Show Awards can be obtained from Paul Corbett, The Orchard, Gatcombe, Isle of Wight PO30 3EF.

Hawkes Bay Aquarium Society

Caryl Simpson gives a shout from New Zealand ...

The Hawkes Bay Aquarium Society is hosting the Federation of New Zealand Aquarist Societies Annual Conference from Friday, 5 June to Monday, 8 June 1998 in Napier, New Zealand. The annual conference is where delegates from all the affiliated Societies receive and action the reports of the various Officers and Committees of the Federation.

It is also a time of learning and sharing knowledge. The renewing of friendships, and the making of new ones, is an important part of the weekend as many of our members only meet at each conference. Apart from the AGM there will be workshops and interesting speakers as well as a tour of local places of interest. Anyone who may be in the area is welcome to attend as an observer.

The Hawkes Bay Aquarium Society may be contacted at kpr@clear.net.nz

Perhaps there will even be some English fishkeepers touring New Zealand during this time who would be interested in attending?

NEFAS Thanks

Kevin Rodway, PRO of the North East Federation of Aquarist Societies, has requested space for the following:

NEFAS would like to thank all fishkeepers who attended their recent Open Fish Show. This year we had a 266 per cent increase in the number of people showing fish and we hope to see the same increase next year.

Best in Show with a *Paratilapia bleekeri* went to Mr and Mrs Rodway from Darlington. Second with a *Heterandria bimaculata* also went to Mr and Mrs Rodway from Darlington. Third with a Barbus 'Odessa' went to Mr and Mrs Mogford from Robin Hood. Best Coldwater Award with a Red Belly Dace went to Gavin Cowan from Solway.

Further details and results are available from Kevin Rodway on 01325 487581.

OPEN SHOWS AND MEETINGS

7 June Derby & District Aquarists 5th Annual Open Show and Auction. Ashgate Infants School, Ashbourne Road, Derby. YAAS Rules. All entries for the show and auction welcome on the day. We look forward to another super, well turned out show in 1998 and to seeing old and new faces. For more information call Simon on 01332 [illegible] (after 6pm) or via email at Dacquarist@ aol. com

14 June Bracknell A.S. Open Show and Auction. Priestwood Community Centre, off Shepley Road, Bracknell, Berkshire. Specialist Societies in attendance. [illegible] Display by BKA Southern Area. [illegible]. Booking of Lots for Auction on the [illegible]. Show details available from Terry 01344 [illegible] or [illegible] 01189 [illegible]

21 June C.A.S.T. '98: 9th Annual Open Show and Auction. The Boys Brigade Hall, Castle Street, Carmarthe, [illegible]. Booking in of exhibits and auction lots from 10.30am till 12.30pm. ALL ENTRIES ARE FREE THIS YEAR. For [illegible] for the auction in advance or details please contact Peter Jones on 01978 [illegible]. Limited to [illegible]

21 June Cotswold A.S. Open Show. For information contact A. Plenter, 01295 266023.

21 June Welland Valley A.S. Open Show, [illegible] Community Centre, [illegible] Road, Corby. Benching 10am-12 noon. Show information and schedule from Alan Henderson, 5 The Nook, Corby Village, Northants NN17 1XA, or phone 01536 [illegible]

21 June Workington & D.A.S. Open Show and Auction. Cumberland Hotel, [illegible] Street, Workington. Benching 11am to 1pm. Judging/[illegible] auction from 1.15pm approx. Auction lots may be pre-booked. Judging under FSAS Rules. Contact Bernard O'Neill: 01900 [illegible]

28 June St Helens A.S. Open Show and Auction. Village Hall, Rainhill, near Liverpool. Benching strictly from 11am to 12.45pm. Judging commences 1pm prompt. Auction 1-4pm. 27 annual trophies. Further information from Mrs H. [illegible], 0151 [illegible], or Mrs E. [illegible] 01942 671463

28 June York & D.A.S. Open Show and Auction. Village Hall, Stockton on the Forest, York. Benching 10am to 1pm. Judging starts 1.30pm. Auction begins 1pm. Booking in lots from 10am to 12.45pm. Competitions, Sales, Stands, Tombola, Raffle, Cafe. Free Car Parking. Information from and enquiries to Open Show Secretary, [illegible] Flower, tel/fax 01904 [illegible]

AUCTIONS & EVENTS

1 June D.A.T.N.E.A. are hosting a talk by [illegible] Hall of Chester Zoo on his recent [illegible] survey of the fish of Nigeria. The talk will be at 8pm at Stella [illegible] Social Club, Albany, District 7, Washington. Tickets at £2 (including pie and peas) are available from Mr A. [illegible], 411 [illegible], Albany, Washington. Tel 0191 415 [illegible]

2 June [illegible] A.S. [illegible] Aquatic Habitat [illegible]

16 June South Park Aquatic Study Society, [illegible], Wandsworth Community Centre, St Georges Road, Wimbledon SW19. Report on Open Show and Phil Wilson talks about his current setup. Further information from Ray Seaton, 0181 [illegible]

21 June C.A.S.T. 98

28 June York A.S.

28 June St Helens A.S.

26 July Oasis F.C.

13 September [illegible] A.S.

15 November FNAS

22 November Oasis F.C.

SHOW DATES AND FESTIVALS

Rule Codes: A – A of A. FB – FBAS. FN – FNAS. FS – FSAS.
I – International Goldfish Standards.
N – NEFAS. U – USAA. Y – YAAS.

6 June S.P.A.S.S. (Coldwater) (I)

7 June Derby & D.A. (YAAS); Erith A.S. (FB)

13 June Bristol Tropical F.C. (FB)

14 June Bracknell A.S. (FB); Castleford A.S. (Y); Tameside A.S. (FN)

21 June C.A.S.T. 98 (FB); Cotswold A.S. (AA); Rothwell & Wakefield A.S. (Y); Welland Valley A.S. (FB); Workington A.S. (FS)

28 June St Helens A.S. (FN); Seaside J.F.S. (FB); York & D.A.S. (Y)

5 July TV Cats (AA)

11 July Port Talbot A.S. (FB); Southend, Leigh & D.A.S.

18 July Bournemouth A.S. (FB)

26 July Merseyside A.S. (FN)

2 August Yorkshire Koi Society (BKKS)

9 August Grimsby & Cleethorpes A.S.; Salisbury A.S. (FB)

16 August KAAS Show (FB) [illegible]; Perth A.S. (FS)

23 August Glenrothes A.S. (FS)

30 August [illegible] A.S. (N); T.T.A.A. (Poor Things) (FB); USA

5 September Bristol A.S. (I)

6 September Alden A.S. (YAAS); Cardiff A.S. (FB); Cunningham A.S. (FB); South London A.S. (AA); Wyke A.S. (Y)

12 September [illegible] A.S. (FB)

13 September Lincoln A.S. (Y); Mid Somerset (BKKS); Silksown A.S. (FN); South of Scotland A.S. (FS)

19 September Plymouth A.S. (FB)

20 September Mid Sussex A.S. (FB); Ulley A.S. (Y)

27 September Dunstan A.S. (FN); Fire City A.S. (USA)

4 October Basingstoke A.S. (AA); Grangemouth A.S. (FS); Halifax A.S. (FN); Littlehampton & [illegible] A.S. (FB)

11 October Doncaster A.S. (Y); Warrington A.S. (FB)

18 October Halifax A.S. (FN); Solway A.S. (FS)

19 October West Cornwall A.S. (FB)

24/25 October British Aquatic Festival, Manchester (FN)

30 October/1 November Supreme Festival of Fishkeeping, Weston-super-Mare (FB)