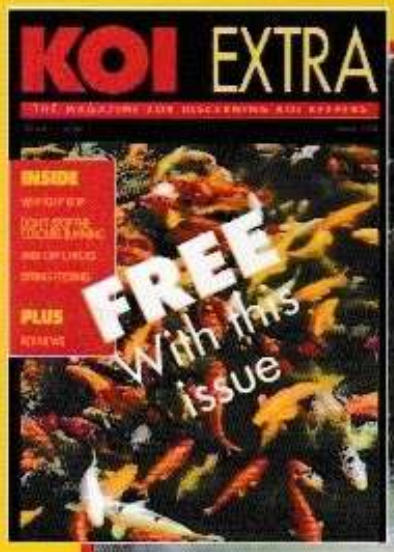
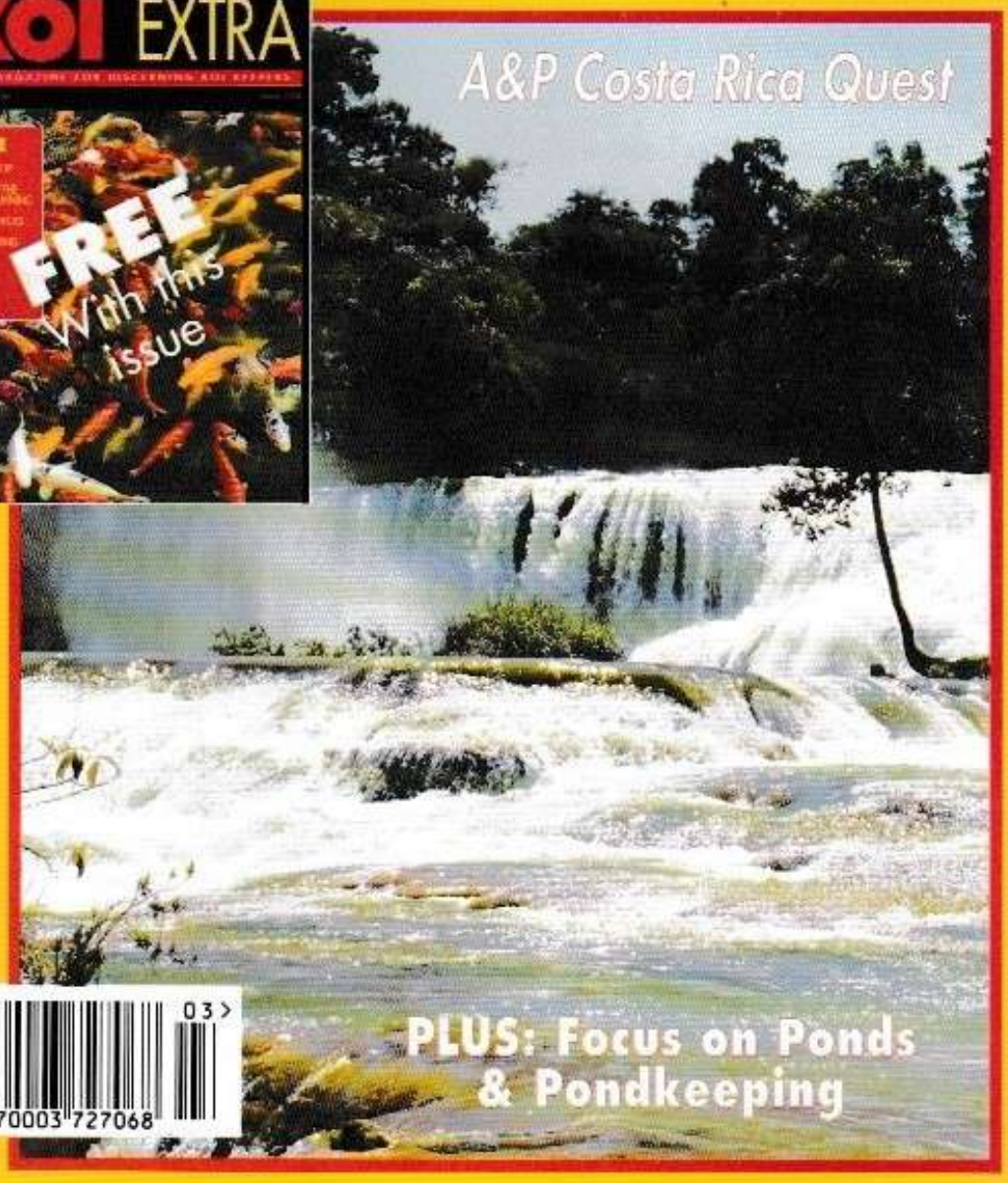
AQUARIST & PONDKEEPER

MARCH 1998 $2.25

The Better Fishkeeping Magazine





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MARCH 1998
VOL 62 NO 12

AQUARIST & PONDKEEPER

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01233 636349

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01233 631239

SUBSCRIPTIONS
Rates on application
All subscriptions payable in advance to: MJ Publications Limited,
20 High Street, Charing
Nr. Ashford, Kent TN27 0HX

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

Distributed to the Newstrade by: USM Distribution Ltd., 86 Newman Street, London W1P 3LD

ISSN 0003-7273

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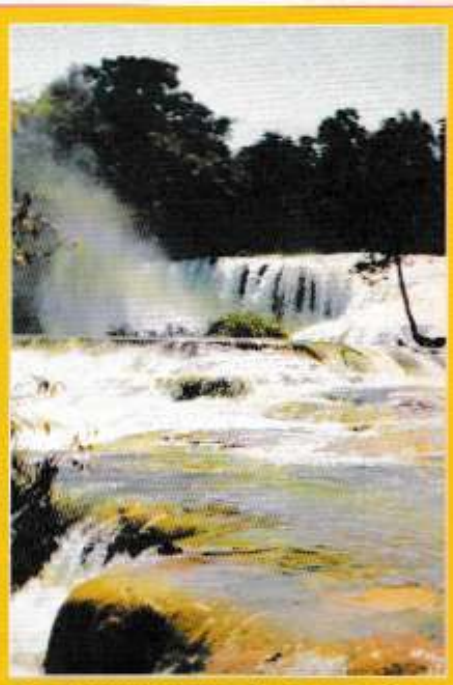

We invite readers to participate from the comfort of their own armchairs, in the A&P Quest to Costa Rica in the company of that intrepid explorer, Derek Lambert. Not for us the discomfort of bumpy roads, insects, temperamental weather and the excitement of catching real fish in their natural world — just plain enjoyment and no little envy!

PHOTO: DEREK LAMBERT

COMMENT

This issue of A&P initiates another new feature. From March to August we will be including 'Koi Extra' with each issue, an 'add-on' especially created for our Koi keeping readers. Each month there will be several articles, each written by experienced Koi keepers, covering a wide diversity of topics — and at differing levels of 'expertise' so that newcomers are not intimidated and older hands are not patronised.

Also this month we welcome a new regular face to our team: Liz Donlan has bravely agreed to take on Koi Calendar, another important and valuable column for Koi keepers everywhere; Liz is a member of the Northern Koi Club and over the coming months will, no doubt, establish her own style to the column pioneered by David Twigg. We hope that Koi Society Secretaries and Public Relations Officers will continue to support Koi Calendar in future as much as they have done in the past — the service is there for you to use so don't lose out on publicising your activities.

On the 'front of house' side the person who will undoubtedly become a familiar name to you (should you have occasion to telephone 'Head Office') will be Gwen McNeill, our new Advertising Manager. As her previous position was with a pet business-related publication we know that Gwen will have no difficulty in fitting into the A&P way of things — she probably knows just as many people in the hobby as we do!

EDITOR

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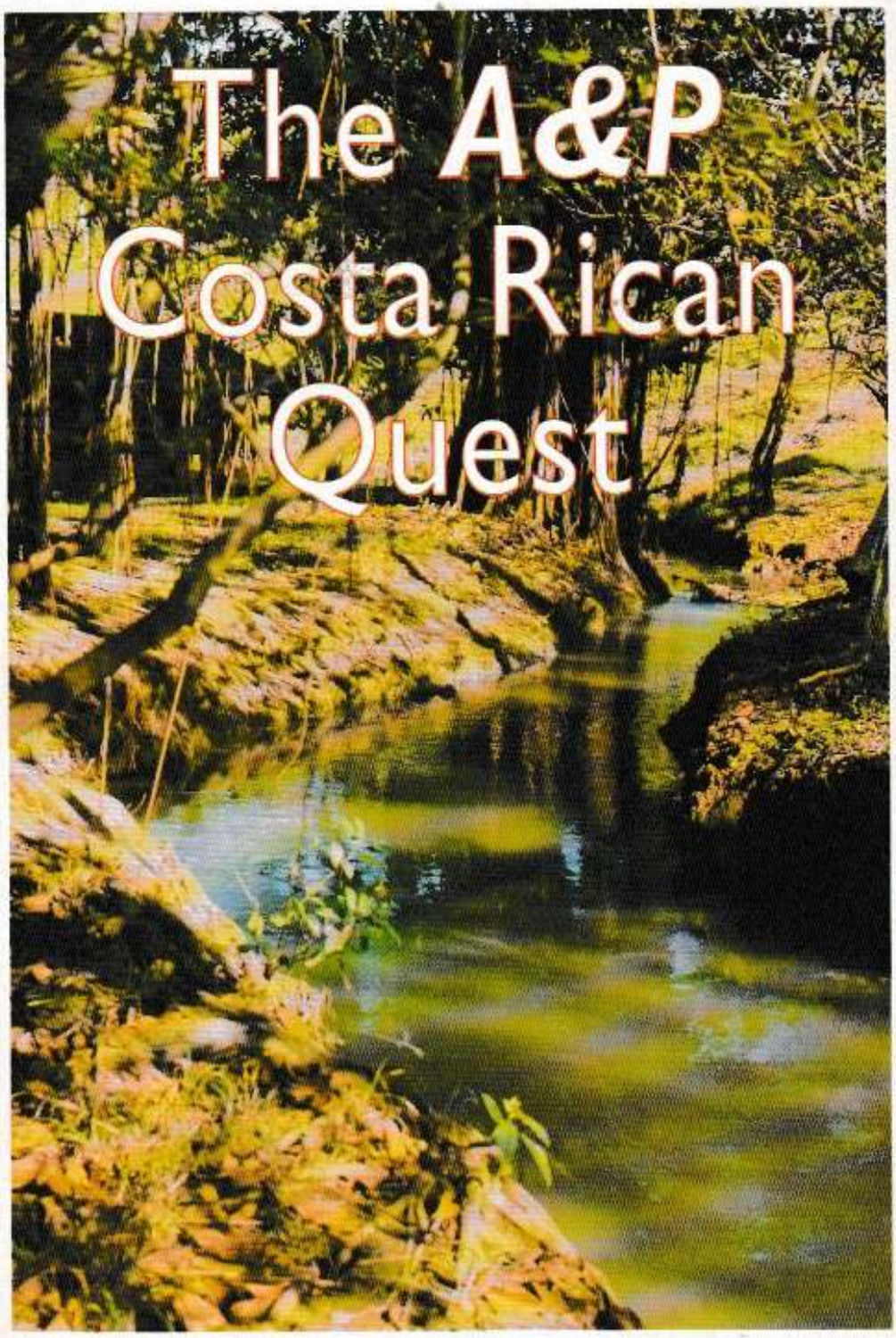
SPECIAL FEATURE

The A&P Costa Rican Quest

Derek Lambert shares his preparations for a new expedition

PHOTOGRAPHS BY THE AUTHOR



Small stream near Lake Camécuaro

Ever since I was a young lad of about 10 years old I dreamed of going on a fish collecting expedition. At that time this was just a child's pipe dream which was never likely to come true, but with the advent of package holidays and jet travel it is now possible for many people to enjoy this unique experience. Over the coming year I shall be taking you through all the stages of such a trip and reporting on both the experience of the expedition itself and the fish which come from Costa Rica.

The first of these deals with the planning stage of this expedition but all the points raised here could equally apply to anywhere else in the rest of the world.

PLANNING

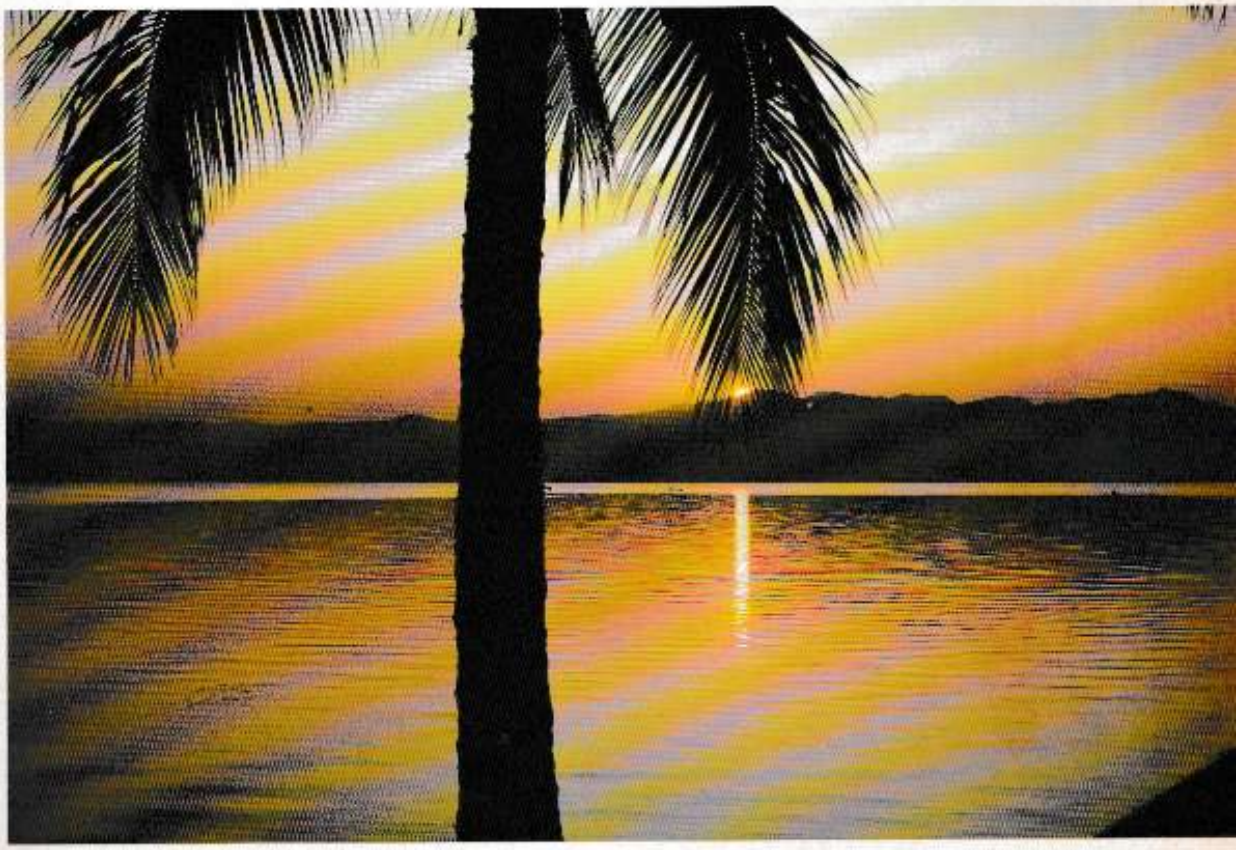
When planning any trip the first thing you have to decide on is where you want to go. Making this decision is not as simple as it may at first seem. If, like me, you want to visit the wild habitats of a number of different fish which you keep in your tanks, then you might think all you do is just look up where they come from and visit the country concerned. Great in theory, until you find out some of the fish come from a war zone, whilst others live in such remote parts of the world you would need to fly in on a private plane or travel by boat for weeks on end to reach the collecting site.

This trip was to visit a country I had never been to before in Central America. When you mention Central America to most people it conjures up images of jungles, wild animals and guerrilla warfare.

The tragic political and social mess many of these countries have been embroiled in for decades now has left most of us with the image that the whole of Central America is like this and only a madman would want to go there. There is, however, a country in this fascinating area of the Americas which has had the benefits of a stable democracy for half a century now and in which you would be safer than walking down a city street anywhere in the so-called civilised world. This is Costa Rica.

FIND OUT ABOUT THE PLACE

Once you have decided on the country, you now need to find out all about the place. To do this I visited my local library to take out every guide book on the subject they had. For this trip Fodor's *Guide to Central America* would do the job, except they only had a copy published over 10 years ago. Since it was costing nothing I took it with me. None of the other guides covered the area I wanted, so I had to look elsewhere for information. In the end I purchased the *Lonely Planet Guide to Costa Rica* (price £10.99). This was updated in 1997 and books in this series have always proven reliable in the past. This included a 36 page colour section on the wildlife including details of three species of rabies-carrying vampire bat! Which brings me nicely on to vaccinations.



Lake Catemalo.

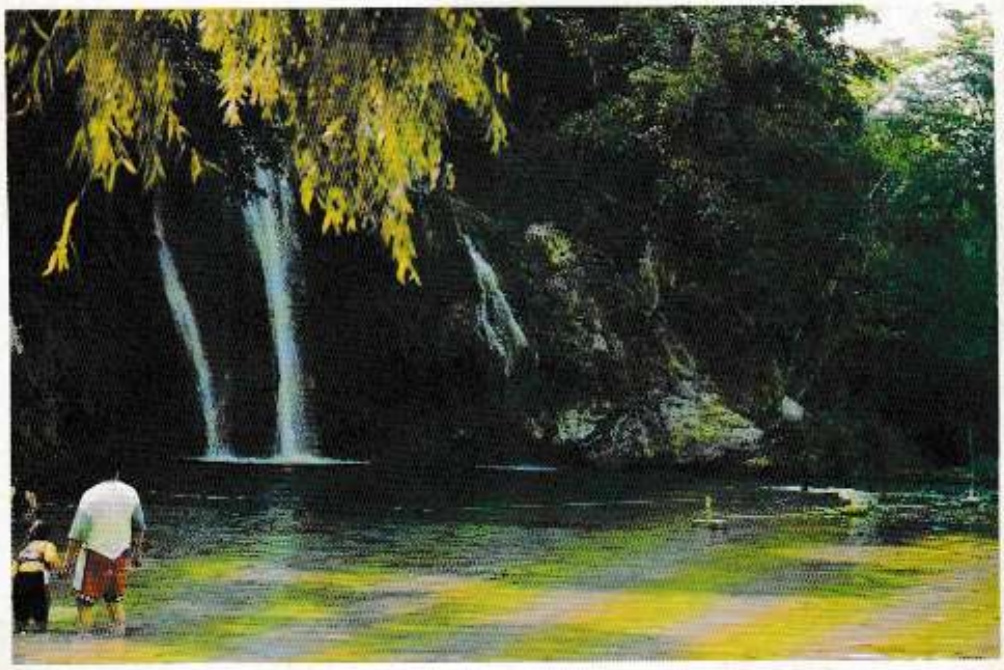
IMMUNISATION ESSENTIAL

The A&P Costa Rican Experience

Despite having been all over Mexico and Jamaica I have never bothered having jabs or even taking anti-malarial drugs. This was stupid in the extreme but I got away with it. Being so much further south and well into a malaria zone I decided to do the job properly and have all the jabs advised for this area. When I visited the surgery the nurse looked at various different charts and tut tutted. It turned out I almost didn't have enough arms or weeks left to have them all done in. Typhoid and Hepatitis A were the first two, followed by Rabies, then Polio and Tetanus boosters. As well as all this lot I needed anti-malarial tablets which my doctor had to prescribe.

This is why they recommend visiting your doctor at least eight weeks before you travel. The nurse also gave me details of MASTA which runs a traveller's health line. This provides advice on over 250 countries and 84 diseases. They take details about the countries you will be visiting, when you are travelling and the type of living conditions you will be experiencing (this could be very important if you are floating up the Amazon River on a boat). From this they send you a personal health brief including advice on immunisa-

The most important fish we will looking for on the trip is the Saltfin Brachy, *Brachyrhaphis terrobensis*.



Rio Atoyac.

tions and anti-malarial tablets needed as well as the current Foreign Office advice.

Apart from immunisations, etc, you will also need to sort out health insurance. This is something I am very well aware of since I had to have an appendectomy in Mexico a few years ago. Without insurance it would have cost over £3,000 for the operation, hospital care and medication. Insurance can usually be purchased at the time you buy the flights or book your holiday.

In the past I have taken a package tour to the country I wanted to visit and then hired a car and travelled on from there by myself. This gives you a home base as well as the services of a rep. The only problem is that you are often travelling on smaller or more cramped planes and most representatives try to put people off going outside the resort area because it is 'not safe'.

One package I have not taken yet, but friends of mine have, is a fishing trip on a boat up the Amazon. These are organised specifically for aquarists and the price includes return airfares from Miami and trans-shipment of your fish back to the USA. All you have to do is ship them on to the UK and arrange the flights out to the starting point.

If you decide to go as an independent traveller then you will need to organise your own flights. You can do this through a normal travel agent if you want but you may find yourself being offered flights at the normal full fare instead of the cheapest possible. Thomas Cook offer an excellent service on cheap flights or you can go with a 'bucket shop'. I phoned Airline Ticket Network on their free phone number for this trip and they sorted me out a good deal on the price and a reasonable route. The earlier you can arrange your flights, the cheaper and better route you will be able to secure.

The next thing to think about is where and how you are going to travel in the country concerned. This means checking out car hire and any other ways you want to travel. Most major car hire companies have a central free phone number in the UK so you can ring them and book your car before you even leave the country. They then send you a voucher which you give to the company the other end. Every time I have tried to do this there have been problems with the price. Now I just get a quote so I know roughly how much it will cost and rent the car when I get there.

NO ACCESS BY ROAD

For Costa Rica I noticed that one of the areas I wanted to visit there was no access by road. The guide book suggested travelling by boat along the canal or taking a plane. Checking on the Internet I discovered the return flight from San Jose would cost only $90 and I could book it from here by credit card. That solved that problem and I could get on with planning the rest of the trip after this.

The A&P Costa Rican Experience

Now sorting out places to visit on a fish-collecting expedition is not as easy as it would seem. Looking in most aquarium literature you will find a general country given for a particular fish, you might even have the general province but few books give you exact locations. For these you need to check out the scientific papers, articles written by other collectors and, if possible, talk to scientists and other aquarists who have been there. The more information you come up with, the more likely you are to find the fish you want. I do this sort of research months or even years before going to a country. Much of it is gathered simply because I am interested in the types of habitats my fish come from but it is always useful to have on hand in case a trip comes up.

When working out my route I arrange it so the most important locations are visited as close to my return home as possible. This way I make sure any fish collected from these have the best chance of survival. To me the most important fish we would be looking for on this trip is the Sailfin Brachy, *Brachyrhaphis terrabensis*. Apart from these I had been asked to collect a few fish for scientific study, but since these were to be preserved it would not matter when they were collected.

PHOTOGRAPHING FISH SPECIES

Another important job was to be the photographing of as many fish species native to Costa Rica as possible. Some of these were for a book I am co-writing with Manfred Meyer on livebearers and the rest were to build up a complete pictorial library of Costa Rican fishes.

So, looking at the trip as a whole I would have to start with the flight out to Tortuguero and then back to San Jose. Then hire the car and using the most logical route which would cover all the places I wanted to visit, end up with a few days in hand in the general area where the Sailfin Brachy comes from. Finally, drive as fast as possible back to San Jose arriving in the capital at least a day before my flight home. This way if anything went wrong (like the car breaking down) I would have time to get back for my flight.

To do this sort of careful planning you will have to have a good large scale map. Since most places only sell the normal tourist maps I always take a trip down to London a little while before I go and check out Stamfords. This shop stocks large scale maps of much of the world and will normally have on hand the sort of thing needed. With this in hand, it should be possible to find all the locations you have information about and work out your expected route.

All through this article I have been dealing with this trip as though I have been going on my own, when in fact I shall be travelling with a good friend of mine, Arthur Frisby. Arthur runs Frisby Aquatics of Hull with his hard working wife Gwynn and has accompanied me on several trips before. We get on together great and have the same passion and interest in all species of fish. I say this because you have to be very careful with your choice of travelling companion. I have been very lucky over the years in my choices but I have heard some real horror stories. Like the three collectors travelling down to Central America who had an argument on the plane and one of them didn't speak to the other two for the whole of the expedition. Or the three collectors who arrived in Mexico City only to discover that they all wanted to visit different areas and collect different fish. Or the group of four people who had to drive for two days back to the airport so that the fifth member of the group could fly home because he was 'fed up' with fish collecting.

COMPATIBILITY IMPORTANT

So you see, compatibility is very important. Choose who you travel with wisely and make sure everybody knows exactly where the team is going and what it is looking for. Sort out who will be driving, what sort of vehicle you want and the type of hotel you will be staying in. Problems can arise when one member of the team is on a tight budget and the others want to stay in a four star hotel. All these things need dealing with before you go so you cut down on friction in the field. Remember you will be living together for at least two weeks and that will put a strain on even the best of friends.

Focus on
PONDS & POND-KEEPING

Pond Design

▶ Even a modest sized pond can make a corner of the garden look attractive.

Dick Mills

says there's more to pond design than just deciding where to dig the hole!

PHOTOGRAPHS BY A&P LIBRARY

The trouble with fishkeepers is that they have a very focussed view of things and it's the same with gardeners. When the two areas of interest collide you can well imagine the difficulties over what takes preference. In recent years the upsurge in water gardening has introduced many more people to fishkeeping who, until you mentioned it, would never have regarded themselves as that — to them having a pond was merely another gardening feature and the consequences of having to consider the difference having living animals in the pond came as quite a shock!

Similarly, when the fishkeeper 'moves out' from the indoor aquarium the temptation to go as big as possible for that huge outdoor aquarium can also be understood. But somewhere between the water feature on the patio (oh yes, some people assume you can keep fish in them, too) and the 'wall to wall' water pool (some will say anything is better in order to cut down on mowing the lawn!) there must be a happy and affordable compromise that suits both the fishkeeper and gardener in our personalities.

A Number of Things to Take into Account

Faced with deciding what pond to install there are a number of things to take into account and, to my mind, the most important decision to settle before any other is what you intend to keep in the pond. This is quite a critical decision to make as in many cases 'upgrading' (or changing your mind) at a later date can be either impossible or expensive!

For instance, a modest-sized pond to attract wildlife and insects is not the same as wanting to keep Champion Koi! In between both these extremes there will be the 'Everyman Pond' complete with Goldfish and aquatic plants. So what's the difference, as far as design is concerned — aren't these all just variations in size, one from another?

Let's take a some examples: imagine you are a love-sick Frog or Toad, impatient to get into amplexus (the polite word for it!) with the lady of your dreams. The last things you want to encounter in your mad, passionate dash for the water is a high brick wall of a raised pond, or a pond placed in the centre of a huge, well-manicured lawn surrounded by trees in which sit some Frog/Toad-hungry birds!

How Are You Going to Get Out of The Water?

Now supposing you are the issue of a happy amplexus, a young tadpole swimming happily with fast-developing legs and a taste for land exploration. How are you going to get out of the water when there's a sheer vertical wall to overcome? It needn't all be 'let's be kind to amphibian week'; we should think of our fishes too.

Focus on PONDS & POND-KEEPING

Pond Design

Shallow water means rapid changes in temperature, easy predation by cats and herons plus even more problems when winter comes. Even installing a large pond to maintain a stable environment is not the complete answer if the fish you keep insist on eating the water-purifying plants as soon as they are introduced. A pond not only has to be suitable for its intended inhabitants but it must also be maintainable to meet any special requirements, which may mean thinking hard about room for filtration units and accessibility.

For what is best described as a 'Nature Pond' a pre-formed, rigid shell can be adequate. Such ponds are of modest size and often come with the animals' very requirements built in; these include a shallow depth (often not more than 18in or 0.5m), a sloping 'beach' end and even some access or entry ramps. Those that have planting shelves incorporated around the edges will fit very aesthetically into an existing garden and, if an adjacent bog garden is created, any amphibian for miles around will soon get the word of the existence of such a 'Des. Res.'

One Factor that Might Be Overlooked

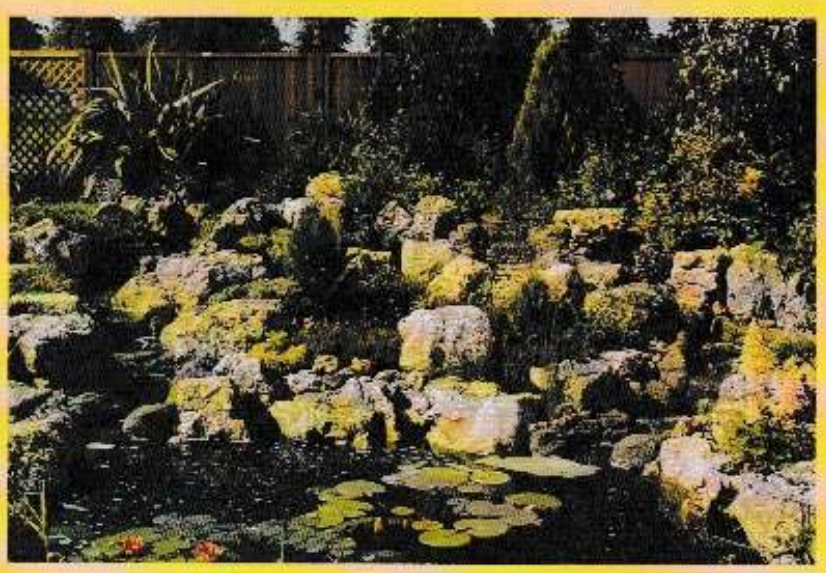
One factor that might be overlooked is what to do with the 'spoil' — the large amount of soil excavated when digging the hole. Although a very practical way to avoid this problem would be to build a raised, 'out-of-ground' pond, the majority of ponds are 'in-ground. In many locations the earth, when dug from any reasonable depth, is not of suitable quality to be evenly spread over the rest of the flowerbeds but can be used to form a pondside bank. This bank can be used as a base for a shrubbery or, as is more usual, to form a rockery (again for plants) but also as a handy site for an external filter.

Pumping the water from the pond to the filter is easily achieved and, working on the principle what goes up must come down, what better way for the water to return to the pond than via a waterfall or an imaginatively-created cascade down the side of the 'spoil?' As to which side of the pond the 'rockery' faces depends on the view of the pond you wish to present to the house, and also which way the sun passes over the garden — these two parameters may clash.

Arranging 'Services' to the Pond

Many words have been written about the adverse effects nearby trees can have on a pond and there is no need for them to be repeated here. Less is usually written about arranging 'services' to the pond, notably a supply of electricity. To save undue excavations the length of the garden, together with the requirement of armoured (or otherwise protected) cables and

▶ Too much rockwork can overpower the rest of the garden.



circuit breakers it is well worth considering low voltage equipment.

In this instance the cables need not be so robust and require less protection by virtue of there being no danger should they be severed; a more recent development has been in the introduction of solar-powered equipment (yes, the manufacturers insist we do get enough sunshine) and the energy-collecting panels can be mounted at the pondside obviating the need for long cables back to the house.

One 'service' needed by owners of large ponds, especially those intended for Koi, is for water disposal during water changes. When designing a pond installation, it is worth including plans for this as well as the more usual 'drains' for channelling pond water to gravity-fed filters, unless you intend to regularly water the garden, the provision of a good soakaway pit is well worth considering.

The Correct Type of Filter for Your Pond

On the subject of filters, remember to include the correct type for your pond and to provide space for it. External, pump-fed 'box' types (whether they be single or multi-chambered is immaterial at this stage) can be situated as we have intimated within the rockery; perhaps this is the best situation in order to keep pipework and demands on the pump to a minimum, as a more remote installation will include more initial work.

With gravity fed filters, these are, by necessity, sited alongside the pond itself with horizontal water 'transfer ports' built into the 'wall' of the pond. As these filters in themselves can occupy at least a third of the volume of the pond, sufficient space must be allocated to them when planning a pond: however, disguising them with decking and transforming them into a fish-watching platform is not difficult and the end result can be a very decorative addition to the whole garden as well as being very functional to the pond.

Deciding where to site the pond can be an art in itself. Building a pond in that 'little used corner' of the garden isn't necessarily going to bring that corner to life. If such a corner is at the bottom of the slope, in permanent shade or out of sight of the house then why would you want to put a pond there? Ponds within sight of the house, conservatory or patio are great — some people even build them indoors in conservatories such is their devotion to fishkeeping. You could take a leaf out of the public aquarium's book by building a pond on a slope and incorporating a viewing window in the exposed vertical side (shame if this side faces away from the house!). The existence of a slope surely encourages two ponds linked by a trickling stream but again the pipework has to be carefully planned and the correct pump size used.

Protecting the Pond from The Elements

Protecting the pond from the elements can be achieved by low shrubs or a nearby hedge. Try to avoid 'run off' surface water entering the pond from lawns or even that nearby rockery; fertilisers and weedkillers added to the garden would certainly then find their way into the pond water with dire results. Whilst a sunny position is to be recommended for the pond, too much of this good thing is to be avoided if green water and other algae based problems are to be circumvented.

Building a pergola over the pond will bring controlled shade and also give the pond a disguise from any prowling overhead heron on the look out for a fish meal.

The foregoing is an overview of many of the basic things you need to consider when designing a pond installation. There are, of course, the extra details such as shape, size and materials that then come into play. Nowadays, the trend is towards lined ponds for up to medium sized installations with the use of concrete being reserved for the very largest, formal designs. Pre-formed ponds, usually of reinforced glass fibre, provide the 'entry level' size but you are limited in design (and colour) to those of the manufacturers' choice. When shopping for a pre-formed pond remember two things — they always look much bigger out of ground and kidney-shaped designs may be actually stronger than plain-sided or circular designs.

Importance of Size and Location

The size (and location) of the pond is best decided before you venture out with credit card and roof rack. Draw a plan of the garden to scale and sketch in the location of the pond and all its ancillary equipment (filters, cable-runs, drains, etc). Next, go into the garden and draw out a full size outline of the pond on the ground in the intended location using a long length of hosepipe or by trickling sand on the ground. Now go back indoors (preferably upstairs) and look at the pond outline as it appears in relation to the real surroundings; get a helper to make adjustments if necessary whilst you direct. Make sure you take note of the sun's movement throughout the day, the prevailing wind (which will be sure to blow autumn leaves your pond's way) and anything else which might affect the pond.

Designing a pond is not just concerned with its physical appearance however elegant or imposing. You must also design practicability into it to ensure it operates to its best level once installed. Follow a few basic guidelines and you won't get a pond that overpowers the garden or one that you can't service.

Nick Dakin comes across some beautiful small packages

PHOTOGRAPH BY THE AUTHOR

SMALL is Beautiful

Pyjama Wrasse, *Pseudocheilinus hexataenia*

Family: LABRIDAE

If I was asked to name one group of fish which featured a wealth of attributes such as beautiful colouration, tireless activity from dawn to dusk, ease of feeding, a generally peaceful nature, compatibility with invertebrates and disease resistance, I would lay odds that the questioner would not be expecting a realistic reply. And it might be true to admit to some difficulty in identifying an individual fish that would fit the bill, let alone a group! But they do exist and they are called ... Dwarf Wrasses! This might be a fresh term to many marinists, but by that I mean Wrasse that grow no larger than 10cm (4in).

Without a doubt the family Labridae is a very large one, encompassing well over 400 species.

Without a doubt the family Labridae is a very large one, encompassing well over 400 species.

Sizes occupy a vast range with the smallest never exceeding a miniature 6cm (2.5in) and the largest proving a monster at 2.1m (7ft)! Only a fraction of these are available to the hobbyist as viable tank specimens but, nonetheless, the choice is still quite broad and very appealing it is not widely known that many juvenile Wrasse act as cleaner fishes — discounting the Common Cleaner Wrasse (*Labroides dimidiatus*) which spends its whole life performing such duties — and these are generally

recognised by their distinctive red and white livery, although such colouration is not exclusive to Cleaning Wrasse. One theory for this type of behaviour argues that it gives the very young fish an opportunity to mix safely with other larger, and potentially predatory species, in relative safety; and this would seem a very reasonable explanation. Whatever the reason, certainly their masquerade works very well as juvenile Wrasse are very common on the reef.

FEEDING

Owing to the immense numbers involved within the Wrasse family it is just not possible to make too many generalisations regarding various characteristics but it would be fair to say that nearly all species are opportunistic feeders. They will scavenge the rocks and bottom for marine worms, crustacea and almost anything edible, whilst also keeping an eye open for any suitable planktonic foods that might be drifting in the current. Even though Wrasse are very catholic in their tastes, algae does not appear to feature as a favourite diet for any particular species.

NIGHT-TIME PROTECTION

Nearly all Wrasse, and particularly the dwarf species, take refuge during the hours of darkness below a soft, sandy substrate, sometimes burying themselves up to 3in beneath the surface. This strategy for night-time security should, as far as possible, be provided for in the aquarium by supplying a few inches of coral sand on the base of the aquarium. If there is none available, the fish do not appear to be unduly stressed as long as there is plenty of rockwork within which to hide.

A BEGINNER'S FISH?

Most species prove excellent choices for enthusiasts at all stages of the hobby. Easy-going temperaments make them good community fish and very desirable for the mixed fish/invertebrate aquarium.

FEEDING IN THE AQUARIUM

Practically any marine fare will suit dwarf Wrasses. They are greedy feeders and will accept flake, Brine Shrimp, Mysis, Lobster eggs; in fact, almost anything that can be swallowed!

Small is Beautiful

MIXING IT UP

In most cases dwarf Wrasses cannot be mixed in the aquarium. Two Wrasse of the same species will usually fight until one, or both, are dead. Even unlike species cannot be trusted and usually end up in a vicious scrap. Admittedly, one might see a tank full of same-species Wrasse in a dealer's tank appearing to offer no problems, but this will generally not carry over to the showtank where territories are soon established and defended vigorously.

DISEASES

In most cases, dwarf Wrasse are very resistant to all manner of diseases. Wrasse rarely contract any serious ailments where water conditions are good and are consequently capable of surviving for many years. An exception worth mentioning is the Cleaner Wrasse, as this is highly-susceptible to illness where water conditions are in a state of deterioration.

TANK SIZE AND WATER CONDITIONS

Dwarf Wrasse are ideal for aquaria as small as 36x15x12in, although larger tanks are always preferable. Ammonia and nitrite: Zero. Nitrates: Not exceeding 25ppm but much lower if possible. Specific Gravity: 1.020-1.024. Temperature: 75-79°F. Good quality water changes of 15-20 per cent every fortnight. Activated carbon filtration and efficient protein skimming as standard.

LIGHTING

Wrasse in themselves are not at all fussy about lighting conditions and will thrive in moderate to bright conditions, depending on the requirements of other livestock sharing the same tank.

HEALTHY STOCK

Dwarf Wrasse are always active and must be seen to be so. They should have clear eyes, and unblemished bodies. Fins should show no signs of being ragged or clamped to the body. A healthy appetite is also a sure sign of good health.

Freshly imported specimens may have a tendency to hide beneath the sand for a day or so, but no longer if they are in good health. A move to a new aquarium might also elicit the same response.

Under no circumstances must any attempt be made to 'dig it out' unless it remains unseen for more than three to four days. In cases such as this disease is usually the cause and must be treated immediately.

DETECTING A DWARF SPECIES

The question is often asked: "How can I tell a Dwarf Wrasse from a larger species?" And the answer is, you can't, unless you do some homework on the subject first! For example, many species of Wrasse are imported as tiny juveniles in a more attractive and saleable colour form. These include the African Clown Wrasse and the Twin-Spot Wrasse. Both can be found on sale at around 2.5cm (1in) in length, however, within a few short years they will each achieve 20-30cm (8-12in)!

The following species are widely recognised as being in the 'dwarf' category and most are generally available:

- **Cleaner Wrasse (*Labroides dimidiatus*)**
- **Dwarf Parrot Wrasse (*Cirrhilabrus rubriventralis*)**
- **Banana Wrasse (*Haliochoeres chrysus*)**
- **Banana Wrasse (*Haliochoeres trispilus*)**
- **Pyjama Wrasse (*Pseudocheilinus hexataenia*)**
- **Dragon Wrasse (*Novaculichthys taeniorus*)**
- **Parrot Wrasses (*Cirrhilabrus* sp.)**
- **Green Wrasse (*Haliochoeres chloropterus*)**
- **Four Line Wrasse (*Larabicus quadrilineatus*)**
- **Various Coloured Cleaner Wrasse (*Labroides* sp.)**

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

Focus on
PONDS & POND-KEEPING

Installing a Pond

Whether you conform to a pre-form, or think a liner is finer, let Deborah Goodhall guide you through the process

Ponds can be very rewarding: the satisfaction that you've created a pool of serenity your busy world can bring tranquillity not only to your garden but also to your life. Whether your pond is for effect or for fishkeeping the most important thing to remember is that if a job's worth doing it's worth doing well. Taking your time and buying the right materials for the job now can prevent much heartache (and hard work) in later years. The time and effort you put in now by buying from a reputable firm and taking their advice can save you pounds in the future.

There are several ways to construct your pond: the most popular is to use a flexible liner, these allow you to design the shape of your pond to suit your garden, or if you only want a small water feature you could use a pre-formed liner.

The positioning of your pond is very important. Partial shade, although not

▶ Look closely at this magnificent pond and you will see it's made from a sheet liner.

PHOTOGRAPH BY GORDON WIGENS

under a tree as fallen leaves and twigs will pollute the water, or where the pond will not be exposed to sunlight all day is preferable, as a pond that sits in bright sunlight for most of the day does not allow any shelter for fish or other pond life. Excessive sunlight also accelerates the growth of algae.

If you re installing a flexible liner you must consider the depth of the pond. If you are planning on keeping fish the minimum depth is 50cm or if you are keeping Koi it is recommended that your pond is over 1m deep.

Shallow ponds can be affected by frost in winter and overheating in summer which will not only affect your fish but also the water quality.

The shape of your pond is equally important, simple shapes are best, too complicated and the liner can be tricky to install meaning lots of folds and creases (and hard work for you!). Kidney shapes are extremely popular as their walls are structurally stronger and less likely to collapse than other shapes, although rectangular ponds are common. Variations of these can be created by having two ponds, perhaps a smaller one flowing via a cascade or waterfall into another.

Installing a Flexible Liner

Mark out the desired shape of your pond with string or hosepipe and carefully dig around this outline.

Once you have done this remove the area of turf and begin to dig down. After removing about 30cm depth then mark out a smaller shape within the pond area, approximately 20cm from the outside edge. This will act as a marginal shelf for any plant life. Apart from looking attractive, plants provide additional oxygen for the pond and shade for your fish. Continue digging until your pond is the desired depth. Using a spirit level ensure all the flat surfaces are level in the pond.

Once the basic shape and shelving has been created all the sharp stones need removing from within your pond. When this is done re check the level of your pond. Using the spoil from the pond as foundations for a cascade or waterfall is a good idea, alternatively, use it to create a rockery to compliment your pond.

After removing so much from the pond area it's time to put something back in. It's a good idea to cover the flat surfaces — the base of the pond and the shelving — with a layer of sand approximately 1.5-2.5cm thick. This not only provides valuable cushioning for your liner but will also protect it from any stones hiding under the surface from penetrating and puncturing your liner.

Underlaying your pond is vital. Some books recommend that you use either old carpet or newspaper to underlay the liner — under no circumstances use any material that will rot or decay over a period of time. As the carpet or newspaper rots the liner will start to drop which will cause problems if the liner has been secured at the top with flag stones or concrete.

If the liner has been secured very well the liner will become taught and this kind of strain on the liner could cause it to tear and leak at the very least, the concrete or mortar may also crack.

For a professional start to your pond use a quality fabric underlay which will not rot providing your liner with maximum support and protection from root penetration throughout its life. Polythene underlays effectively and inexpensively protect your liner and help prolong its life. All good underlays, whether fabric or polythene will provide extra cushioning, protection from stones. It is advisable to purchase your underlay with your liner to ensure you have the right product and amount for the job.

Underlay usually comes in rolls that will need cutting into lengths to be laid over the pond area and tucked into the corners. The underlay protects and cushions the side walls and prevents weak spots from developing in the liner. Sometimes the lengths are difficult to keep together so fixing tape is ideal for this purpose.

When choosing your liner it is advisable to purchase the best you can afford. If you're choosing a flexible liner always go for one with a long life guarantee. These are available from most water gardening companies, insisting on the best at this early stage will save you time and money in the long run. Pre-formed liners are extremely durable and usually come with a guaranteed life of 20 years.

Calculating the size of flexible liner you require can be a complicated process, most water gardening advisors are happy to help with the mathematics if you provide the dimensions of the pond. Alternatively you can measure the pond yourself with a tape measure, going down into the base over any shelving and allowing 50cm of overlap at each side. This overlap is required to allow for the folding and tucking of the liner and for securing to the edge of the pond. If you know the dimensions of your pond you can calculate the size using the following simple formula:

Width + Depth + Depth + Overlap = X

Length + Depth + Depth + Overlap = Y

X and Y give you the width and length of liner you require.

Installing a flexible liner itself is quite easy. Lay the liner over the area of the pond and fold and tuck into all the corners of the pond. You may have to get into your pond to do this properly, removing your footwear will prevent teasing the liner at this early stage, liners are not usually guaranteed if damaged during installation so care is required. Once you have done this, secure the liner loosely at the edges with stones or small bricks to keep the liner in place.

When filling your pond with water continue to tuck and fold.

Focus on PONDS & POND-KEEPING

Installing a Pond

moving the stones and bricks to suit. The pressure of the water will hold the liner in place as the pond fills. If you correctly tuck and fold at this stage you will be left with a tidy finish once your pond is full. The temporary securing should be left for a couple of days to allow the liner to settle before you add the permanent edging.

Installing a Pre-Formed Pond

Installing a pre-formed pond is similar, start by marking out the hole by using the pond itself and outlining it by cutting the turf with the spade. Take into account the shelving and pre-cast mould of the pond as you dig down. If the pre-formed pond is an awkward shape you will probably find yourself placing the pond in and out of the hole until the pond fits properly — the top of the pond should be level with the surface.

After clearing out any stones use a spirit level to check that the base is level. Although it's not necessary to use underlay with a pre-formed pond it is recommended that a layer of sand is placed in the base to provide support for the weight of water in the pond.

Pre-formed ponds are often contoured for effect rather than to provide a marginal shelf. This makes it rather difficult to match your hole to your pond. Any gaps between the pond walls and hole should be filled with sand rather than the spoil from the pond as sand can adapt to the shape of the pond and offer better support for the liner. You may need to manoeuvre the pond within the hole to allow the sand into all the nooks and crannies. Once you're happy this is secure, you're ready to add water.

Finishing Off

The most common finish to a pond is paving flags. If you're using mortar or concrete you'll need a special additive or concrete otherwise the lime from the concrete will leach into the pond when it rains — killing any aquatic life. Alternatively, you can seal paving flags with a concrete sealant which will prevent the lime from leaching.

Now your pond is installed you're ready to start installing your pump, filter box and ultra violet clarifier. You should wait at least two weeks before adding any fish or aquatic life.

Information supplied for the above article by Bradshaws

Steve Grant explains how he discovered two new species of *Corydoras*

PHOTOGRAPHS BY THE AUTHOR

The Story the Story

Corydoras kanei, Living Paratype.

In the January issue of *A&P* I described two new species of *Corydoras*, the culmination of several months hard work. My interest in catfishes, especially *Corydoras*, has grown quickly during my relatively low number of years of involvement in the aquatic hobby. I became a member of the now defunct Catfish Association of Great Britain. I am still a member of the Northern Area Catfish Group, Castleford Aquarist Society and am currently a Y.A.A.S. 'B' Class Judge. Anyway, enough about me.

Inspired by aquarists like Dr David Sands, who have become partly involved in the scientific side of the hobby, I became interested in describing a new species of *Corydoras*. I got advice from Dr Sands about whether a person needed ichthyological training/education to do it. He explained that it was not needed but of course one had to know about the concepts involved, the genus (group of fishes) and of course had to follow the International Rules of Zoological Nomenclature.

Armed with this I kept a look out for *Corydoras* in aquatic outlets, trying to spot if any were possibly unknown to science. The only way to do this initial selection is to research and know a lot about the genus. It didn't take long to find two obviously different species of *Corydoras* mixed together but being sold as one species. They were being sold as *Corydoras bicolor*, Nijssen and Isbrucker, 1967, but they were obviously not that species. I purchased all specimens which consisted of four of a short-snouted species (*C. kanei*) and six of a long-snouted species (*C. crimmeni*).

FIND ORIGIN

I asked George, the shop owner, to try and find out their origin from the wholesaler who had brought them into the country. A few weeks later he gave me the following location: Guiana, Roraima District, near to the city of Boa Vista. Upon checking a map of South America it became clear that Boa Vista and the Roraima District are in Brazil, near to the border with Guiana. As to what river or creek they are from I cannot be certain but the Rio Branco runs directly by Boa Vista and it is the main river in the area.

To add to this *C. kanei* seems to appear in the Aqualog — All *Corydoras* — on page 41 as S20446-4, C.sp C46 similar to C.sp "Rio Branco". The picture shows a male and female and the location is given as Peru, Rio Branco. The Rio Branco does not extend into Peru. They may be getting confused with the city of Rio Branco which is hundreds of miles away from the river of the same name.

Once home I grew the fish on as it is preferable to have adult fish when describing *Corydoras* as some of the ratios which are expressed, ie, Head Length in Standard Length, tend to differ in young fish. They were kept in slightly acidic water at a temperature of 72°F, and fed on tablet food and frozen Bloodworm. They were housed in a small tank with undergravel filtration and kept with some of my other *Corydoras*.

I was determined that the fish would be photographed alive in case they turned out to be new species once preserved and measurements and counts taken. *Corydoras* have been continually described since the year 1794 and up to the 1980s ichthyologists and aquarists usually did not photograph their specimens before they were preserved (many ichthyologists were sent preserved fish for study), usually they did a line drawing, a black and white photograph or nothing at all. This has led to many squabbles over the years between aquarists, especially at Fish Shows (I should know!) as to the identity of these fish in life, books often giving varying ideas/pointers. I wanted to avoid this and the only way to do it is to have photographs of the type specimens. My only regret is that I did not have them photographed professionally but I was so caught up with getting on with the job of preserving, measur-

Behind

Corydoras kanei, Living Holotype.

ing and 'counting' the fish.

In my presentation last month (*A&P*, January 1998), photographs 1 and 3 showed the living Holotype of each species and photographs 2 and 4 a living Paratype of each species. This is important as only specimens that you buy or see should only be called *C. kanei* or *C. crimmeni* if they conform to the photographs and verbal description given. (The photographs shown here of the Holotype and Paratype of *C. kanei* are more true to life in terms of their colour than the photographs in the original description).

Neither species appear in any other book or magazine, not even in the Aqualog although C46 and *Corydoras* sp. aff C14 "RIO BRANCO" are similar to *C. kanei* but not the same.

A word on preserving the fish. Formalin is a dangerous chemical and should be used with caution.

COMPARE DATA

For me to know whether my specimens represented new species I had to compare their data with that of similar-looking *Corydoras*. Colour and patterns are diagnostic to a degree (Nijssen, 1970) but other comparisons needed to be made in addition. To do this I had to get the original descriptive scientific papers and/or other subsequent work covering these species. Some of the earlier described species descriptions are either very brief, not in English or very hard to obtain. I got mine through the Natural History Museum but most local Libraries offer a similar service.

This fact-finding part of the process is very important but can take some time. One may be tempted to cut corners and use aquatic publications to compare such as colour or patterns, or use fish bought from shops for morphometric and meristic comparisons. This cannot be done as one cannot be certain of the true identity of what one is buying no matter how much one thinks one knows about the fish involved.

Aquarists may have frowned at some of the species I compared my fish with when they look up the species in their aquatic publications on *Corydoras*, but it is my opinion that a lot of the pictorial identifications are wrong (Dr Han Nijssen told me that he feels that 50 per cent of books have it wrong and he is one of the world's leading experts on *Corydoras*).

One has to refer to the type specimens and associated literature when describing new species or there is a very high risk of creating synonymy. This is where the fish that is being described has already been described before, under another name. Synonymy only serves to confuse scientific study and aquarists and that is why a lot of ichthyologists, including Dr Nijssen, are not keen on aquarists such as myself describing new species in aquatic publications although even the experts, including Dr Nijssen and Isbrucker, have described species that have turned out to be synonyms!

I feel that if one has done the necessary research, work and comparisons, new species descriptions are useful when done correctly. Giving a definite name to a fish brings some order into the lives of the thousands of people across the globe involved in the hobby; it also serves (which is its primary purpose) to catalogue species to science.

I tried to compare my fish to as many species of *Corydoras* as possible even if they only have a few aspects which are similar. This again is to try and avoid synonymy.

A THOROUGH APPROACH

Hopefully I have shown that with a prepared, systematic and thorough approach people can get more involved in the scientific side of the hobby, but before anybody even thinks about attempting to describe any fish, think about the hard work, learning, study and time involved. Ninety-nine times out of a hundred fish will turn out to have been described already. There are thousands of Cichlids, Catfish, Killifish, Livebearers, Anabantoids, etc, that have already been described to science, some of them for hundreds of years. The likelihood of finding a new valid species is low indeed. Each family of fishes requires different analysis to even check what genus they belong to never mind what species, ie, Loricariids have checks made on the number, placement and type of teeth, body scutes, abdomen plates amongst other things. Couple this with the fact that some fish species have sub-species, differences sometimes being colour pattern and/or location only, some Killifish for example, and you can imagine how difficult it is to do the job right. It is also important (21 valid species of *Corydoras* have been described using one specimen only), although not necessary, to have more than one specimen as the one you have could be a hybrid, mutant or a geographical variant of an already described species.

NB: The following pattern descriptive information was omitted from the original description for *Corydoras crimmeni*:

Adipose fin spine and outermost principal rays of caudal fin show small brown spots. Depending on mood, some specimens show a brown to black patch on the first four to five VBS after humeral shield (see Photograph 4), this patch was also evident in specimens preserved in alcohol.

If anyone wishes to contact me about the descriptions or anything else in this article please do not hesitate to write to me at the address provided in January's *A&P*.

George Turner describes the genus *Aulonocara* and some near relatives

PHOTOGRAPHS BY THE AUTHOR

Malawi Cichli Waters and S

Aulonocara are relatively slow-moving and peaceful and are better kept on their own or with some of the smaller and less aggressive mbuna.

Three deep water *Alticorpus* species from a single trawl haul off Monkey Bay: (from top to bottom), *A. pectinatum*, *A.* 'deep' and *A.* 'geoffreyi'.

Many species of genus Aulonocara are popular in the aquarium trade. These 'Malawi Peacocks' are primarily rocky shore species, which inhabit caves or range short distances across open sand. All species forage in the sand, hovering motionless to use their expanded lateral line canals to detect movement of invertebrates concealed in the sand. Males of many species are brilliantly-coloured.

Most of the rocky shore species attain very small sizes in the wild, but grow much larger in the aquarium — like many rocky shore cichlids.

In comparison to the hyperactive mbuna, *Aulonocara* are relatively slow-moving and peaceful and are better kept on their own or with some of the smaller and less aggressive mbuna, such as *Labidochromis* or *Cynotilapia*. Females of most of the rocky shore species are virtually indistinguishable: those of the cave-dwelling species tend to be generally dark-coloured, with brown vertical bars, while those of the more open-living species are usually silvery with faint bars. Probably, for this reason, most of the aquarium-bred stock offered for sale appear to be hybrids and males are generally rather drab in comparison to the wild-caught fishes. To avoid risk of hybridisation, no more than one species should be kept per tank. The rocky-shore

ds of Deep andy Shores

A magnificent male of the rare *Aulonocara* 'gold'.

species are well-known to aquarists, both through imports of many species and the books of Ad Konings. Much less is known about the species of the sandy shores and deep waters.

LONG SNOUTED SPECIES

The largest of the *Aulonocara* species, *A. rostratum*, is a long-snouted species growing to at least 20cm long. Males, which are bright-blue with numerous egg-spots on the anal fin, nest in colonies and dig pits in the sand. They are found throughout the Lake, from shallow waters to as deep as 30m. It has been bred in captivity, producing broods of between 50 and 150 fry.

Aulonocara cf *macrochir* is a similar-looking species, which has a shorter snout and larger eyes. Males are more greenish and have only four to five eggspots. This species is common in the southeastern arm of the Lake on sandy and muddy areas, at depths of 18-75m. Females are more greyish than those of *A. rostratum*, which have a pinkish iridescence. It grows to around 18cm.

Two species are distinguished by having very small mouths which point upwards rather more than other similar species. *Aulonocara guentheri* is a shallow water species found on muddy shores all round the south-eastern arm, as well as at Senga Bay and in Lake Malombe. Females are silvery with sandy coloured stripes, but the mouth, chin and belly, as well as the pelvic, anal and pectoral fins are bright lemon yellow — the only *Aulonocara* species known to have this colour pattern. I've never seen a ripe male. It feeds on Chironomids (Bloodworms) and Mayfly larvae.

Aulonocara 'copper' is an undescribed deep water species with a similar body shape. It has a completely different colour pattern of dark brown stripes, with an iridescent coppery sheen. Mature males taken from trawl catches were much darker with dark grey stripes, a black chin and metallic blue cheeks. It lives at depths of 60-120m in the southeastern arm and around Mbenji Island. A similar, but much slimmer species, has been collected from trawls at 90-126m depth. I've only seen a handful of preserved specimens of this fish and know hardly anything about it.

There are a number of medium-size deep-bodied species which mainly live in deep water. Probably for this reason most of them have large eyes. The taxonomy of this group is not properly worked out yet but there are at least two or three species. At depths of 90-120m some of the males are strongly striped with dark grey bands on a pale background. Some have dark grey heads, but others have orange heads — these are probably different species. Living in shallower waters, at depths of 40-90m, is one of the most attractive of the newly-discovered species, *Aulonocara* 'gold'.

STUNNING AQUARIUM FISH

Males, which can reach 15cm long, are bright golden-yellow with bright blue cheeks and snout. This would make a stunning aquarium fish but it is not very common and is found at depths just beyond the safe range of diving. Who knows, maybe one day it may be found in slightly shallower water where it could be collected alive?

Another interesting species is also found just at the limit of diving, ranging from 30-72m depth. I called this *Aulonocara* 'pyramid' because of the strange shape of its head, which is triangular and very flat at the bottom. This species also has huge elliptical eyes, which is very unusual for a cichlid.

Nothing is known about it behaviour, but it has a very wide, flat lower profile, more like that of a catfish than a cichlid. It probably spends a lot of its time lying on the bottom. Males, which grow to 12cm, are silvery with dark stripes and have yellowish fins and a bright blue metallic colour on the snout, lips and cheeks. Since I've only seen a few specimens of this fish this may not be the full breeding colour. So far, I've only found this species between Monkey Bay and Boadzulu Island in the southeastern arm of the Lake, but I collected a similarly-coloured male with a more normal body shape from near the Maleri Islands.

There are six or seven small species which mature at 8-11cm long. All look very similar superficially with typical *Aulonocara* body shape and can only be told apart by microscopic examination or when males have developed their breeding dress. The largest of the species is *Aulonocara* 'blue-orange' which is found on clean sandy beaches, especially to the north of Boadzulu Island on the eastern shore of the south-east arm. Males have a bright orange head and chest, with blue lips and snout. Females have bright orange pelvic and anal fins, but are otherwise a plain sandy colour.

A chironomid feeder, it is found

in water shallower than 30m. A similar, but smaller and slimmer form occurs on muddier beaches south of Boadzulu Island and in slightly deeper water, 25-35m. In the same area, the dominant *Aulonocara* is A. 'orange' which is smaller and has similar-looking females, but males have a uniformly orange head, without the blue snout. At depths of 35-40m just north of Boadzulu Island I have collected two more species. *Aulonocara* 'dark stripe' is similar to A. 'orange', but with a dark stripe through the eye. A. 'green' is a more slender form with unicuspid teeth, unlike the bicuspid and tricuspid teeth of similar species. Males have metallic green cheeks, orange spotted fins, and a bright orange margin to the dorsal fin. More common is *Aulonocara* 'yellow', another slender species not exceeding 8cm long. Males have a bright lemon-yellow head and a silvery body with dark stripes. The fins have orange spots, and the dorsal a broad white margin, tipped with black at the front. This attractive little fish is found from 40m to as deep as 95m.

SLENDER LITTLE FISH

Finally, there are two tiny species found only in extremely deep water — 90m or more. Both are slender little fish mature at 5-7cm total length and so must be among the smallest Lake Malawi cichlids. *Aulonocara* 'stonemani' has the typical body shape for the genus — rather flattened below and with big eyes. So far all the specimens I have seen have been rather drab and silvery, with males only showing a few yellow spots on the fins and a black margin to the pelvics. *Aulonocara* 'minutus' is more unusual, being very

The rare and bizarre *Aulonocara* 'pyramid' lives in the most heavily-crawled area of Lake Malawi.

Immature male *Aulonocara nyassae*, the largest species of the genus.

slender with extremely elongated fins. Males have strong black bars, with bright green colour in between. A few similar specimens I have found are bigger and more drab with an orange head. These may be a different species.

The species of the genus *Alticorpus* can only be distinguished from the *Aulonocara* because they have a bony knob on their chins — they are surely close relatives. Alticorpus are principally deep-water fishes, and are among the most numerous cichlids at depths of 100m or more.

BIZARRE CICHLID

Alticorpus pectinatum is a deep-bodied species with a small mouth. Ripe males are a brilliant sulphur-yellow, especially on the head, and have dark brown stripes. There may be several other similar species, including *A. peterdaviesae* and *A. profundicola*, but little is known of these. One of the most bizarre cichlids is *Alticorpus macrocleithrum*. It looks deformed, with a strange bony projection just under the rear of the operculum in front of the pelvic fins. No-one knows the function of this. It is extremely common at about 120m depths, but occasionally small specimens are found in waters as shallow as 60m. Males are silvery with rusty-brown stripes and fins and have a blue snout. These species all have small mouths and quite a few long slim gillrakers. They probably feed on small insect larvae hiding in the sand, just like the *Aulonocara* species.

Alticorpus mentale is a bigger, nastier-looking species with a huge mouth and few widely-spaced gillrakers, suggesting it feeds on larger prey — probably other fish! The mentale reaches a length of at least 25cm and is the dominant fish-eater at depths of 60 to 120m. Males are black with silvery stripes on the flank and large pale eggspots. A similar species, *A.* 'geoffreyi' is slightly smaller. The males are brown rather than black and have blue cheeks and snouts.

Malawi Cichlids of Deep Waters and Sandy Shores

Male *Aulonocara* 'green', photographed on the only occasion this species has ever been recorded.

An unusually deep-bodied male *Aulonocara* 'yellow'.

Focus on
PONDS & POND-KEEPING

Cats and Ponds Don't

Linda Lewis looks into deterring the pond's oldest predators

PHOTOGRAPHS BY THE AUTHOR

▶ View of my cat proof pond edges well disguised.

I love cats, don't get me wrong, but not when they go fishing in my pond!

Ever since building my first pond I have carried out a running battle with cats. Although they never actually managed to hook any of my fish (the herons managed that one for me) they were pretty good at terrorising frogs, and would think nothing of sitting by the water for hours staring at the fish. I have never owned a cat myself, but am always pleased to give affection to anyone else's cat that chose to visit.

What Better Cure for the Blues?

When I lived in London my neighbours' two Tonkinese cats spent more time in my house than their own. I confess I loved them both dearly. What better cure for the blues than giving a cat a cuddle and being rewarded by purrs of contentment? Of the two, Oscar was the fishercat.

One day I managed to sneak up on him, and pounced. Oscar leapt three feet in the air and landed right in the pond. Like most cats, he loathed water and from that day forward gave the pond a wide berth. Of course, this method is a bit hit and miss. So is setting up a hosepipe so that any cat can be given a soaking. First problem, you have to be there at the time, second, it is very difficult to approach a cat without it hearing you.

Physical barriers are

Go!

another idea. If you put Holly branches round the pond, cats will stay away — the problem is that it keeps people away too. The other difficulty for me is that I simply hate Holly. I hate the way it remains prickly even when the leaves are half way decomposed. You can, of course, put netting or chicken wire over the water but this doesn't look very nice and prevents some of the water life that I enjoy so much from gaining access to the pond.

One method that sounds odd, but that does seem to work, at least on bright days, is to place empty plastic bottles half filled with water in strategic places. When sunlight glints on the bottles, this frightens the cat. Great idea, which does the trick, but only when the sun shines! The drawbacks are that your neighbours will think you've gone mad and, frankly, a garden littered with old bottles does look a little strange.

Various Deterrents

Various deterrents based on smells that cats don't like are available. The success rate of these is variable. Most work well if only for a limited time (they get washed away when it rains) then you need to remember to buy more. Being hard up (and forgetful), I was looking for a more economical method.

When I moved to Devon I took the opportunity of designing my pond with the express purpose of making it cat-proof. Instead of a pre-formed pond I used a pond liner. Where before I had edged the pond with stone or concrete I used grass instead. A small area was allowed to overflow creating a bog, and a large very shallow shelf was built to allow any animal that might fall in, an easy escape route. The grass soon grew, down and into the water. This had the effect of obscuring the edges so that it was very hard to tell exactly where pond ended and terra firma began. Any cat trying to get close enough to fish, found its paws were disappearing into the water. At the very least, this upset their balance so that any swipe at a fish would be very clumsy and bear no chance of success.

At best, the cat decided to go elsewhere — problem solved. Of course, I still had umpteen cats visiting the garden for other purposes!

My husband acquired an air gun and enjoyed taking pot shots at any visiting cats. I had no worries about this for I knew he was a dreadful shot. So long as he was aiming at the cat, he would never hit one. The noise of the gun going off did startle the cats though, but they soon came back.

Electronic Cat Scarer

My next move was to invest in an electronic cat-scarer. These work by transmitting a random series of ultrasound signals which are outside the range of human hearing but are heard, and disliked vehemently, by cats. These work well but have a limited range and for my long thin garden,

I would need several to cover the whole area. They also don't work on cats that have any defects in their hearing. I watched various cats stray within range. Most pricked up their ears, looked startled, and made a very quick exit, but a few seemed totally oblivious. I came to the conclusion that they were simply unable to hear the signal. This left me with two animals that were a continuing nuisance.

A Snake Substitute

Then I read, somewhere, that cats would avoid snakes at all costs. Not having my own personal collection of trained Adders I kept my eyes open for a substitute and was finally rewarded when I snapped up two plastic snakes at my local boot sale. These were duly placed in the garden. One was in an 'S' shape, rather like an Adder on the move through the grass, whilst the other resembled a coiled up Cobra. The first worked a treat and no cats fouled within yards of it. The other reduced the problem, but did not eradicate it completely — perhaps cats know, somehow, that we do not have Cobras in England!

So now, my garden is largely a cat-free area and my birds, fish and frogs can live in peace.

But do you know something, I do miss those cuddles. Perhaps I should invest in the ultimate cat deterrent — a dog!

▼ The ultimate deterrent — a dog!

A to Z of plants

By **DICK MILLS**

PHOTOGRAPH BY NEIL TRANK

M FOR MICROSORUM

Java Fern is one of those plants which can compete with most things, including vegetarian-minded fishes, so it is an excellent decoration for aquariums in which other living plants would not be suitable. But there is more to it than just being a tough-leaved, bitter-tasting tank decoration.

MICROSORUM PTEROPUS (BL.) CHING Java Fern

The actual genus was defined in 1830 by Link but the species under discussion was originally named *Polypodium pteropus* by Blume in 1828 and later moved to the present genus in 1933. Various literature refer to the genus as *Microsorium* but more recent books appear to have left out the second 'r' — it makes you ponder whether the name has been corrected or whether more recent authors are merely repeating a mis-spelling in an earlier work!

Description: The bright green fronds (being a fern it is technically wrong to call them leaves) are held erect at intervals along a base shoot which grows horizontally. They have a strong central vein with regular side veinings quite apparent at 45° to it. The length of the lanceolate-shaped frond can reach 30cm.

Distribution: South east Asia.

Cultivation and Propagation: It is important to note that the base shoot is not a root and should not be buried in the substrate. When purchased, the Fern is usually attached to a rock or sunken twig but, if not, then it should be temporarily attached by fine twine to a firm surface in the aquarium until its own natural anchoring system becomes established — wedging it between the rocks is another way of making it feel at home. It gets along very well with a light or shady position and soon extends across any convenient surface.

Propagation can be by physical division once the plant becomes large but you will also find that tiny daughter plantlets are formed on the 'leaves' or along the root axis; these can be separated and fastened on to a new site. Broken pieces of frond can be left floating to form new plants, too. Leaving the plant to do its own thing will produce a multi layered plant.

SPECIAL FEATURE

A&P looks in on 'something completely different'

PHOTOGRAPHS BY A&P LIBRARY

CORAL CULTIV
The Wa

Mike Crumpler (right) discusses a few pertinent points with visitors behind the scenes at Chester Zoo Aquarium.

'Plaster-cast' replica corals are rapidly replacing the real thing in public aquaria.

A Coral Conservation Seminar as part of Chester Zoo's continuing series of similarly aquatically-orientated events.

With the increasing popularity of marine fishkeeping in general and reef tanks in particular it was not unexpected that a Seminar concentrating on Coral Conservation should feature in Chester Zoo's continuing series of similarly aquatically-orientated events.

Organised by John Jarvis, Assistant Curator of Liverpool Museum Aquarium & Vivarium, and held at Chester Zoo on November 29 1997, the event was well attended for what some might assume to be a minority interest. The subject matter was originated by John, Chairman of the Coral Conservation Group (CCG) formed in December 1996 which is a part of a sub-group within FAITAG (the British Zoo Federation's Fish and Aquatic Invertebrate Taxon Advisory Group already a strong supporter of conservation and research at the Zoo and spreading its influence into Europe as announced by Justin Bell, of Chester Zoo.

A strong line-up of speakers represented both professional and hobby interests with, it must be said, a great deal of 'hands on' experiences of propagating corals in the aquarium being described by the latter.

John Jarvis opened proceedings, presenting an insight into the Coral Conservation Group outlining its aims and objectives and future development, principally to help raise public awareness for the need to protect coral reefs, the production of coral husbandry guidelines and the phasing out of the use of hard coral skeletons as decoration within aquarium displays. He also discussed

ATION – y Forward

the rare event — coral spawning within an aquarium.

Naturally, the main concern over corals is their collection, not for the aquarium trade as might be expected (and as positively illustrated by OFI-provided material), but by many countries around the tropical world as the raw material for making lime or even paving roads. To these countries coral is just an easily-available commodity. Other crises facing some coral reefs is also damage caused by fish-collecting especially where dynamite is used (see 'Nets, Not Dynamite', another article in this issue) and, inevitably some 'wear and tear' — of not direct collection damage — by the ever-increasing number of tourists. The importation of coral is strictly controlled and Geoff Connor, a Customs & Excise Officer based at Manchester Airport, very ably discussed the problems involved in maintaining control according to the Rules laid down by CITES (Convention in the Trade of Endangered Species) in this respect.

The audience was treated to a wide diversity of views on the culturing of corals in captivity. Les Melling advocating the use of additives such as kalkwasser (calcium-containing limewater) and more exotic substances such as iodine and strontium; other viewpoints included David Saxby recommending plenty of water movement, water changes, lots of lighting and less direct dosing. It came as a surprise to many the extent to which coral propagation flourishes with many species now enjoying extended range through the simple (on the face of it!) method of transplanting severed cuttings from the parent. There's many a slip twixt failure and success and to everyone's amusement Steve Forsyth entertainingly divulged his early practice technique — sewing pieces of Broccoli on to a rock before moving on to the real thing. On a deeper level there was a more intense discussion into the 'adhesives' used to anchor the cutting to any desired surface and these varied between substances which just provided a temporary cushion to those which really stuck the cutting down.

Some corals do not need such anchoring but may be given a firm start in their new location by simply being wedged between two rocks held together with elastic bands (and there was an immediate discussion over the merits or otherwise of using alternative bindings for this purpose!).

Following the lunch break Sascha Thyer reported on her coral propagation progress whilst working at Sydney's Manly Aquarium in Australia and Dr Gordon Reid, now of Chester Zoo, brought 'recent history' to entertaining life with his only too vivid recollections of his work at the Horniman Museum Aquarium — in addition to very primitive exhibit housings, the whole Museum had to be underpinned with several tons of concrete to prevent it sliding down the hill on which it was built!

Colin Grist, of the soon to be opened Blue Planet Aquarium in Ellesmere Port, Cheshire, put forward an alternative to using real corals in public aquarium displays reporting that synthetic (plaster-cast, sculpted and painted) models are now enjoying great success as replicas with the general public not being aware of the difference. He explained how large background pieces do not need quite so much modelling detail and hoped that this practice would eventually lead to the demise of collecting natural specimens.

Colin also described the specially-designed, varying depth aquarium (complete with rise and fall tidal system) for the study of invertebrate life that he worked on during his period as Curator at Bristol Zoo Aquarium and the workings of the popular Jaubert System in marine aquarium where an inert, anaerobic body of water is held beneath a separating 'plenum' supporting the substrate — similar to, but quite unlike, the orthodox sub-gravel filtration system where oxygenated water is constantly driven through the substrate.

With the London Aquarium now into its stride Curator Joe Pecorelli reported on invertebrate breeding and described how the 'New Splash' aquariums bring new breedings to the very close attention of the visiting public. On display at the moment are Seahorses and tiny baby Jellyfish.

As a video of several Japanese 'mega-aquariums' showed, these huge aquatic theme parks would, if they continue to be constructed at such a pace and size and be furnished with the natural coral heads, would soon deplete even further coral reefs around the world.

In addition to the illustrated lectures there were displays in another room presented by Andy's Aquatics, System 2000 and other interested parties. An advance copy of the new TFH Publication, *Corals for the Mini-reef Aquarium*, by Dr Herbert Axelrod (see review elsewhere in this issue) was kindly made available by the publishers so that those present could be made aware of its existence.

With two generous tea break intervals together with question-and-answer sessions at the end of each presentation there was plenty of opportunity for those present to exchange views and ideas whilst the extra treat of a visit to the Zoo's Aquarium (and 'behind the scenes', courtesy of Mike Crumpler) rounded off a very thought-provoking and interesting event.

The panel (left to right): Joe Pecorelli, Colin Grist, Sascha Thyer and Dr Gordon Reid answer questions from the floor.

Famous Faces in Fishkeeping

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

This Month:
LINDA LEWIS

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

LL: My interest in fishkeeping began seriously in 1987 when my employer installed a tropical tank — I had to look after it. Before then I'd kept coldwater fish and had a pond, but did not consider myself a 'fishkeeper'.

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

LL: My first tropical aquarium contained Peppered Corydoras catfish, Neon Tetras, Zebra Danios, Glowlights and Platies. This was 10 years ago and two of the Peppereds are still with me.

A&P: What are your special interests?

LL: I am fascinated by fish behaviour. Even the most common tropical fish is full of interest if you just take the time to watch, and I can spend hours observing the wildlife which lives in or near my pond.

A&P: Are you interested in breeding?

LL: At the moment I only raise fish like Corydoras and Livebearers, as I have limited room. I have several species that spawn in their home tank but, of course, the eggs soon disappear.

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

LL: I have no transport so cannot get to the nearest one which is in Plymouth. If anyone out there is keen on starting a Club in Exeter, please get in touch via *A&P*.

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

LL: I don't exhibit fish myself but I thoroughly enjoy such events for their social side — meeting people and talking fish is the best way to learn (they've probably made all your current mistakes and solved them ahead of you), and because the larger Shows often attract people new to the hobby. I do wish, however, that more information was given to visitors, eg, about what is involved in judging fish, and to explain, for example, why some tanks appear to break the 'rules' on stocking levels.

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

LL: I'd pay the salaries of a team of fishkeeping experts to give tours at all the public aquaria as visitors often have no real idea what they are seeing. I would also like to travel and see fish throughout the world. Maybe I could even learn to swim!

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

LL: I would never keep marines, as I do not have room for a 12x5ft tank! A few marine fish are suited to smaller aquaria, but I believe the majority are not. Except in the pond, I also avoid any fish that can grow to more than 6in, again, because I cannot provide sufficient space.

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

LL: I've just discovered the Baensch Aquarium Atlas series. They are clear, and give useful information about each fish's special requirements and behaviour. I also love the first fishkeeping book I ever bought — Dick Mills' *Tropical Aquarium Fishes* — because I learned so much from it.

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

LL: It isn't. Fishkeeping is a relaxing hobby which, to fully enjoy, you need to spend time on. What good is a lovely tank if you have no time to sit and stare at it. People these days are too busy with other things. If only more fish tanks were included in TV programmes, although I am on edge every time one does appear (especially in films or a drama) because you can bet someone, sometime, is going to smash it!

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

LL: There's always something new to learn, even from fish I've kept for years. I never tire of watching fry develop, even Guppies. Most of all, fish help me to relax. Five minutes watching their world and my troubles are forgotten.

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

LL: I'm don't know. I have postponed all major decisions until I have recovered from the loss of my husband but I'm sure that keeping fish will continue to be a very important part of my life.

FROGS & Friends

By BOB and VAL DAVIES

HERP FACT FILE

Moorish Gecko. An excellent climber with 'adhesive' feet, claws present only on the third and fourth digits of each foot.

PHOTO: BOB & VAL DAVIES

STICKY FEET

One fascinating aspect of certain geckos is the 'adhesive' quality of their feet which enables them to walk on smooth surfaces even in an upside down position. In the wild this ability has allowed them to colonise various habitats such as trees and rockfaces; and as humans developed a settled existence some species took advantage of fences and walls, often actually moving into the houses. Of the 670 (plus) species, with around 260 subspecies, of Geckos roughly one third possess this ability.

With the use of the electron microscope the mystery of this adhesive quality was finally explained. The feet are divided into lamellae or pads which are covered in minute bristles. These are composed of keratin and overlap in such a way that the end of each bristle is free of its neighbours. Further magnification shows the bristle ends to be divided into a number of even finer parts. The fine construction of the bristles enables them to grip even the tiniest irregularity of a surface; thus producing the ability to cling to and run along glass in a vivarium.

Many species in the vivarium actually show a preference for glass rather than rough surfaces such as bark. On such surfaces adhesion is more difficult so the claws are used — certain species have rectractile claws, others have them fixed and are able to raise them when using adhesive lamellae. Sensory organs in the feet detect, at amazing speed, the nature of the surface and bring into play the appropriate response of bristles or claws. These sensory cells can even detect sticky materials such as tree resin and with lightening speed avoid it to prevent the bristles being fouled. Hatchling geckos have the feet covered with a protective layer of skin which is sloughed soon after hatching producing clean lamellae with 'instant adhesiveness'. To discontinue adhesion the toes are lifted at high speed from the front in much the same way as one parts velcro. The clinging power of any particular species is more than adequate to support the body — in certain cases specimens have died in a vivarium and remained clinging.

BULLYING ENDANGERS HEALTH

The Natterjack December 1997 (BHS Newsletter) gave details of some research in the USA which seems to show that in laboratory conditions bullying by large tadpoles of the Southern Leopard Frog (*Rana utricularia*) of smaller species (*Hyla cinerea*) inhibits growth. The large tadpoles appeared to deliberately 'bully' the smaller when feeding which inhibited food intake and wasted energy with the result the smaller tadpoles were stunted. If kept alone the *H. cinerea* tadpoles reached a larger size. As both species inhabit the same area the next step is to discover wheter, in the wild, *H. cinerea* somehow chooses Leopard Frog free ponds for breeding. The thought occurs that our Common Frog and Common Toad successfully share many ponds — possibly 'bullying' only occurs in a limited space.

DOES CONSERVATION WORK?

The latest issue of FROGLOG

UNKNOWN QUANTITIES

'Jewel Swift'. Exact identity as yet unknown. Taxonomy of the genus Liolaemus is still confused.
PHOTO: BOB & VAL DAVIES

There are still many species of reptiles and amphibians about which little is known as they seldom appear in the trade and in many cases have not been studied in the wild which makes it difficult for the purchaser to provide suitable conditions. Imports from Peru are one example; in one shop recently were 14 species of 'Peruvian Swifts'. Each had been given a name by the dealer — Sun Swifts, Black Swifts, Spotted Swifts, Jewel Swifts and so on but no scientific names were available.

Strictly speaking Peruvian Swifts are members of the genus *Liolaemus* which reputedly contains some 45-50 species although this is by no means certain. From the relatively scarce information available they inhabit various types of habitat but mostly 'dense forest areas' in Peru, Chile, Bolivia and parts of Brazil. Certain species are found in desert regions as well as damp, montane forests and at altitudes varying from sea level to 5000m. In the Andes which is near the snow line *L. magellanius* is a native of Tierra del Fuego which is as far south as any reptile lives. The diet is given as 'arthropods, especially ants but occasional plant material is eaten'. The variation in habitat creates problems although even high altitude species experience temperatures up to 30°C (86°F); other species will require anything from 25-30°C (77-86°F). Overnight drop in temperature, degree of humidity and need for hibernation cannot be determined unless the exact location of a specimen is known which is practically impossible. Precise scientific names might help — where these have been determined. Having purchased a pair of 'Jewel Swifts' which have not yet been positively identified, their husbandry has been a matter of trial and error. They are presently doing well at 32°C (90°F) day temperature at the cool end of the vivarium, 20°C (68°F) overnight, in a dry vivarium with a calcium sand substrate. One end contains a mixture of damp sand and peat. A light spray is given daily. Full-spectrum lighting is supplied and food consists of vitamin-dusted crickets with occasional waxmoth larvae.

Most species are said to be egg-layers although several are livebearers. The consignment mentioned above actually contained some species of *Stenocercus* and Lava Lizards (*Tropidurus*). The former have no common name but are related to *Liolaemus* and supposedly need 'similar treatment' (if this can be determined in the first place). These were identified by the whorls of spiny scales on the tail and lateral skin folds on the neck. Poorly known there are some seven to 14 species.

Tropidurus from Tropical South America (20 species) and Galapagos (eight species)' are relatively uncommon and would seem to require fairly high temperatures without too much of a drop overnight and no seasonal variation. They are possibly all egg-layers. Although the Galapagos species have been studied, the mainland species are not well documented.

PROTECTION

Bufo limensis showing dispersal of what appear to be several paratoid glands on the body.
PHOTO: BOB & VAL DAVIES

Prominent paratoid glands are a distinctive feature in toads of the genus *Bufo* (which includes the common British Toad). They are seen as swellings on each side of the 'neck' and possess a number of pores through which a secretion can exude when the toad is provoked. In the Cane Toad (*B. marinus*), and possibly certain others the secretion can actually be squirted some distance. The exact degree of toxicity of the secretion has not been determined for all species; certainly in *B. marinus* it is exceptionally toxic; in some species it may only be unpleasant testing. The North American Colorado River Toad (*Bufo alvarius*) is another known poisonous species which also possess large glands on the hindlegs.

It was interesting recently to see some specimens from Peru, *B. limensis*. We had not previously heard of this species and as yet have found no reference to it but with 130 odd species of *Bufo* it is not surprising that some are poorly known. *B. limensis* has only small parotoids on each side of the neck but would seem to have various others scattered about the body including a prominent one on the upper side of each thigh.

(Newsletter of the IUCN/SSC Declining Amphibian Populations Task Force) contained details of the creation in Brazil of the Amana Reserve (an area roughly the size of Belgium). It joins two other Reserves to make up the largest protected forest area on earth. The new reserve has a human population of around 2,000 but contains a spectacular diversity of plants and animals. Simply creating National Parks/Reserves is no guarantee of protection. The newsletter also gives details of a Symposium held in June 1997 in Honduras at which amphibian declines in Central America were discussed. Most amphibian declines appear to be due to human effects — deforestation and poor land management but even so a number of declines/disappearances in pristine areas evidently have other cases as yet unproven.

Climate change is the favoured culprit. Natural disasters can play

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a part — disappearance of nine out of 16 frog species have apparently occurred in the Parque Nacional Pico Bonito (Honduras). Although deforestation and agriculture are partly responsible major natural disasters have played a part. Lightening caused a forest fire; erosion followed producing massive landslides and silting of the river thus destroying a large amphibian habitat. However, other disappearances have occurred along the untouched, higher stretches of the river.

FROGS & Friends

By BOB and VAL DAVIES

Although Honduras has a large number of National Parks and protected areas little protection occurs in practice.

Declines are not restricted to Central/South America — details were given of amphibian disappearances in National Parks in China. In one case commercial exploitation was thought to be a major factor but climate change is not ruled out; in another area of marshland has gradually become drier, even producing sand dunes, causing a reduction in the numbers of amphibians which were formerly abundant.

CANCER CURE?

The African Clawed Frog/Toad (Xenopus) previously used widely in pregnancy tests is now regarded as a possible means of combating cancer. Single celled frog and toad eggs are much larger than the human ovum and are therefore easier to study. Hopefully new gene therapies may be developed by studying the manner in which the frog eggs replicate DNA which could provide clues to the process in humans and possibly enabling development of an artificial chromosome to replace DNA in cancerous cells. Currently chemotherapy can affect healthy cells but this research may produce a means of targeting the cancer cells only.

LIZ DONLAN'S KOI CALENDAR

Hello! My name's Liz Donlan and I'd like to introduce myself as I take up Koi Calendar, a task I feel will be both easy and daunting. The easy part is because of the ground work put in by David Twigg who has built up such an enthusiastic support for this column; the harder part will be seeing if I can engender the same support from Koi people out there!

To let you know where I'm coming from, as they say, I've been keeping Koi since 1974 and, once the bug bit, I'd go anywhere and do anything in relation to Koi. At Society and National levels I have been associated with the BKKS Northern Section in 1977 and 1993 as Secretary, Raffles Administrator, Supplies officer, Librarian, programme officer and Editor. In 1979 and 1993 I held the positions of Membership Secretary, Supplies Officer, Distribution Manager, Minutes Secretary and General Secretary for the BKKS.

From 1993 to 1995 I held the Editor and Programme Officer jobs with the Northern Koi Club for whom I am still Programme Officer and Show Chairman. I was a BKKS Trainee Judge 1992/3 and have been an independent (self-appointed) Judge since 1993. I have been associated with the Show side of things for many years and have travelled extensively since 1992 looking at Koi in the Far East, including Japan (twice), America and Belgium, and I've just got back from a Koi visit to Israel.

One final thing, I do actually keep Koi in my 3,000 gallon informal pond and I've been collecting Bonsai for the past three to four years. But enough about me!

I must apologise that the foregoing 'scene-setting' paragraphs have taken away space I would have otherwise devoted to my topical Koi thoughts but I felt you ought to know about me first before I started unloading my views on you!

Now to business.

The following information has been received from Koi Societies in respect of their activities for the coming months. If your Society is not mentioned then you know the remedy! You will find how to send information to me at the foot of this section. Happy Koi-keeping!

CHILTERN AUCTION

The Chiltern Section BKKS are holding their Annual Koi Auction at the Camelot Rugby Club, Chaulden Lane, Hemel Hempstead (10 minutes from M1, Junction 8) on Sunday, April 26 1998.

This popular event is an ideal opportunity for fishkeepers from Hertfordshire, Bedfordshire and Buckinghamshire to buy and sell Koi, together with other pond equipment. Registration starts at 9am with the Auction commencing at 12 noon. Can we beat last year's 100 Lots? Buy Koi from 6-24in!

For further information contact any of the following: Mark Clarke, 01582 724194; Gary Howard, 01462 623718; Dave Walker, 01727 860644.

SHOW CALENDAR

MAY

23/24 Merseyside Section BKKS. Japanese Style pet Show & Craft Fayre. Held indoors at Aughton Show Centre, Aughton, Lancs. Contact Bill Tierney on 0151 920 5077.

24/25 South Hants Section BKKS Open Show. South Downs College. Contact George Rooney on 01420 473169.

JUNE

6/7 Worthing & District Koi Society BKKS SHOW. Rugby Ground, Angmering, Sussex. Details from Cathy Robertson, 01903 522738.

27/28 Middlesex & Surrey Borders Open Show. Kempton Racecourse. Contact Dave Webster on 0171-382 8003 or 0181 648 0848.

SEPTEMBER

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

12/13 ZNA Nort of England Chapter. Open Show (Japanese Style). Aveste Sports and Social Club, Bawtry Road, Sheffield. Contact Yvonne Muse, 0114 273 7341 (day), 0114 289 1437 (evening).

27 Northern Koi Club. Open Show at Cascade Water Gardens. Contact Tony McCann on 0161-794 1958.

KOI MEETINGS IN MARCH

4 Leicestershire Section BKKS. Meet at Kirby Muxloe Sports Club. Contact Ray Dunkley, 0116 277 1600.

10 Nottingham & District Section BKKS. Colin Stevens. Meet at the Western Club, Hillside, Nottingham. Contact Shirley Hind on 0115 961 0923.

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

15 Northern Koi Club. Speaker is Peter Waddington of Infiltration. Meet at St. James Hall, Vicarage Lane, off Eccles Old Road, Hope, Salford. Contact Tony McCann on 0161-794 1958.

All Koi keepers are welcomed to the events mentioned in this Calendar (an entry fee may be payable). Further details can be obtained from the contact telephone number quoted alongside the event entry. My thanks go to all Koi Society officials and others who send me their latest events list for inclusion in this column. Koi Society Secretaries are encouraged to continue sending in details of their events, shows and any other activities for the benefit of other Societies, and, of course, any reader who may happen to be in your area and wish to participate. Information should be sent to Liz Donlan, c/o Koi Calendar, 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.

ASK A&P

Marine

Q I am about to set up my first marine tank, measuring 24x15x12in. I have, however, read many ideas regarding filtration, and have also seen opinions stating that such a small tank is unsuitable for marines. Another area that has given me cause for concern is livestock that will be suitable for my tank. I would appreciate some advice on these matters.

A *I have to agree that your tank is very small for a marine tank. Success with a marine aquarium revolves around maintaining the stable environment for your intended livestock. Large aquaria are inherently more stable and as such it is generally easier to maintain water quality. Furthermore pollutants will usually rise more slowly, and not reach as a high a concentration, in a larger tank.*
Having said that, keeping a small marine aquarium is not an impossibility. Indeed your tank will be very easy to physically manage, with regular water changes being particularly easy and inexpensive.
I feel a conventional down-flow, under-gravel filter, powered by a small power head, capable of delivering a minimum of three times the tank volume per hour, would be an ideal, inexpensive filtration system for this small beginner's tank. The system teaches the art of biological filtration, and the essential aquarist's virtue of patience. The tank capacity is important for the power required from the power-head and for the stocking capacity of the tank. Tank capacity in gallons can be calculated as follows:
Capacity = Length x Breadth x Depth (all in feet) x 6.25in UK gallons.
For a tank with an under-gravel filter you need to deduct approximately 15 per cent for the filter and rock-work. For your tank this becomes (I have kept final volumes to a single decimal place for simplicity: 2.0 x 1.25 x 1.0 x 6.25 = 15.6 gallons.
Assuming under-gravel filtration your net volume becomes. 15.6 - 1.6 = 14 gallons.
Therefore, the tank, when fully mature at about nine to twelve months, will only be capable of supporting seven inches of fish.
There are, however, a number of small hardy fish suitable to withstand the rigours of a new aquarium, and the possible mistakes of a beginner. Fish that spring to mind include Damsels, Chromis, Blennies, Gobies, small Wrasse. Another 'classic' possibility is a pair of Clowns with a Sea Anemone. If a 'show' fish is required the Dwarf Angels contain a number of very beautiful specimens, but should only be considered when the tank is at least six months old.
Hardy invertebrates could be kept without impacting on the stocking levels. For example, Cleaner and/or Dancing Shrimps, a single Boxing Shrimp with no other Shrimps, a Conch, miniature Reef Crabs, small colonies of Mushroom Polyps.
This small tank could prove an ideal introduction to the hobby, without spending large amounts of cash, before you know if you will take to it. I wish you the best of luck with your venture.

Koi

Q My Koi have developed white blisters on their body and tails. This does not seem to bother them as much as it does me. Any ideas what the problem might be?

A *You are right in that your Koi are less concerned than you about this problem which is undoubtedly Fish Pox, or Koi Pox in your case. The nodules that resemble candle wax usually disappear as the water warms up.*
Unfortunately, this is slightly infectious. I feel it's more like acne in humans — some get it and some don't, you don't like it, but it won't kill you.

Tropical

Q Please can you help me. I have a 39x15x15in mixed tropical fish tank. I have an undergravel filter with a powerhead (which is on reverse flow), also a Fluval 3 box filter with a spray bar attached, another Fluval 2 box filter with ammonia-removing carbon chips and a bag of Clearwater resin. My problem is that I have a very low nitrite reading but my nitrate reading is very high. I do two water changes (20 per cent) a week; my ph is 6.5 and I use Tetra Aquasafe to treat the tapwater. I cannot seem to get my nitrates down to a respectable level — I have tried everything — my fish do look as though they may be suffering. Can you help?

A *Nitrates are indeed a problem. However, you don't mention which particular fish you are keeping — most are quite tolerant of high nitrate levels. It is nowhere near as toxic as ammonia or nitrite, so your high nitrate level at least means your filters are doing the job! I do wonder if perhaps your carbon needs changing.*
Plants, as you doubtless know, are great nitrate removers, so you could try planting your tank, or increasing the planting. If you can live with it Duckweed is ideal, as you can scoop out and throw away netfuls of it every week (along with all the nitrate it ate to grow!) If you are one of the many people who has problems with plants, I recommend (apart from the Duckweed) Anubias, Java Fern, and Cryptocoryne (especially C. wendtii).
Other methods are by changing the water more often (although too often could stress the fish, and you might like to test your tapwater, just in case it's high in nitrates to start with), or by installing a nitrate filter. Interpet used to do little bags that you put in the filter called 'Nitrasafe' — I used to use these with great effect before I started keeping plants seriously. I hope this helps with your problem.

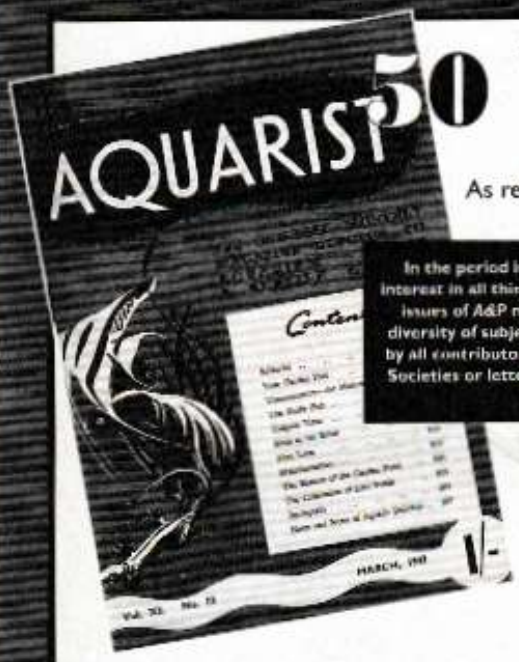
Plants

Q With the coldwater season beginning do you have any tips for successful plant growth in my pond. I annually throw in bunches of weed every Spring never to see them again. Do my fish eat them when I'm not looking?

A *Two things occur as possible solutions to your problem but let's dismiss one of them by assuming your fish are not Koi. The remaining answer is that we have in Spring a distinct time lapse between the Sun getting up and the arrival of pond plants. This leads to an early algae problem (which we won't go into here) but it does mean that you might have to coddle your coldwater plants a little at the beginning. Tossing lead-weighted bunches of oxygenating plants into the pond's relatively cold dark depths won't give them much encouragement to grow; if you start them off in a sunny position, in shallow water, say, on one of the shelves around the pond they should get growing a bit faster than you have been used to. Once they've started expanding their stems you can transfer them to deeper water, there's no need to keep the lead weight on, oxygenators are quite happy doing their own thing as free-roaming floating midwater plants. By the way, once established, they usually grow quicker than the fish can eat them and provide an excellent spawning medium too.*

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. March 1948 threw up this selection of topics ...

Getting involved with a public aquarium sounds like every hobbyist's dream although with the size of today's 'mega-aquariums' only the most brave (or arrogant) of hobbyists would assume that their contributions would amount to much — but way back in 1948 such an opportunity occurred with the then planned Public Aquarium for Hastings. The owner, Mr H. C. Pepper, felt confident enough in finding stock for the 50 plus tanks but appealed to hobbyists in the area — for plants!

The Editorial gently took the rise out of some Societies in the 'north-west' of England for adopting 30 year Standards (imported pictorially from America) when there had been two very recent updated changes in our own Standards — about which these Societies appeared to know nothing.

Then, as a contrast, there was a feature on no less than four Societies within the Montreal area of Canada who were only too happy to import fishes across the border from America.

In recent years readers of *A&P* became very familiar with the name of Eric Hardy and his long-running series 'Naturalist's Notebook' — it was interesting to see the first part, 'Aquatic Insects', making its appearance in his series 'Pond-Hunting for Beginners' 50 years ago this month.

***A&P* Editor Alex Fraser-Brunner concluded a series of weekly lectures to the East London Aquarists & Pondkeepers Association including such subjects as 'What is a Fish?'; 'Anatomy of Fishes;' 'Movements of Fishes;' 'Reproduction of Fishes;' 'Diseases of Fishes;' 'Distribution of Fishes'; and, finally, 'Fishes for the Aquarist'. It is believed that this was the first time such a series of lectures had been delivered to any Society anywhere in Britain.**

The new 'Directory of Aquarium Societies' listed no less than 64 Societies.

Following on from his article in a previous issue of *A&P* A. J. Claxton of Kings Lynn found himself in great demand as a Guest Speaker, finding himself engaged by the Suffolk Aquarists' and Pondkeepers' Association to whom he emphasised the importance of keeping things simple; it is not known how many members took up the challenge of marine-keeping.

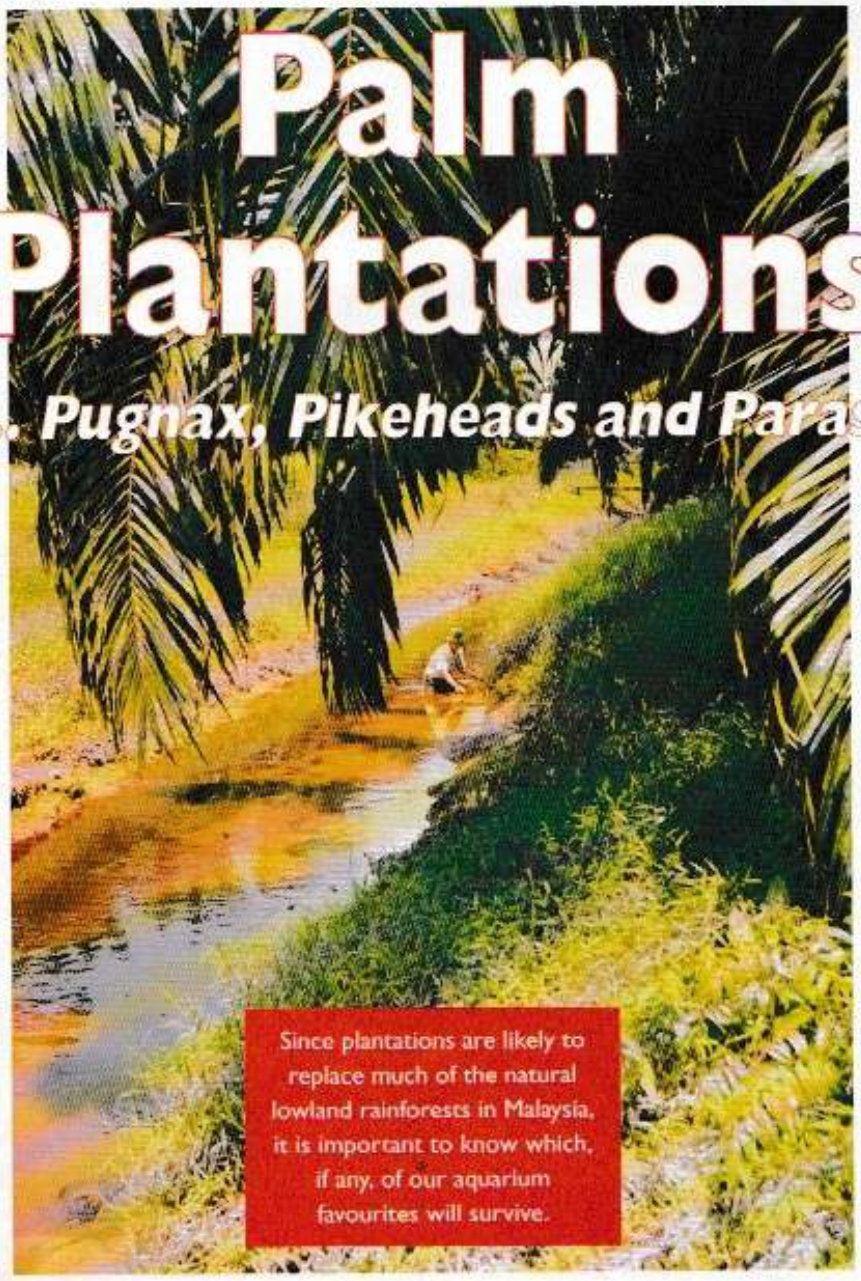
The restoration of aquarium tanks continued unabated as, with aquariums apparently costing three times their pre-war prices (Shock! Horror!), many aquarists hammered straightened those out of shape frames and reglazed them. Tank bottoms continued to be made out of slate although 'crinkly surfaced glass' was becoming popular except where gas or oil was used for direct heating. A left-over memory from the war included the use of Asbestos Compound (used to coat automobile engines to enable them to function underwater), together with linseed oil, putty, gold size or varnish to make up an excellent glazing cement. Today's mind boggles at the prospect of using such materials!

David Armitage picks the wrong time, catches wrong species and gets very wet in his search for surviving fish in an altered environment

PHOTOGRAPHS BY THE AUTHOR

Peninsular Palm Plantations

... Pugnax, Pikeheads and Paras!



Habitat of Luciocephalus pulcher en route to Pontian.

Since plantations are likely to replace much of the natural lowland rainforests in Malaysia, it is important to know which, if any, of our aquarium favourites will survive.

Peninsular Palm Plantations

MAIN PHOTOGRAPH Habitat of B. pugnax near Kotta Tinghi.

INSET PHOTOGRAPH B. pugnax from the habitat photographed by the roadside immediately after capture.

Luciocephalus pulcher.

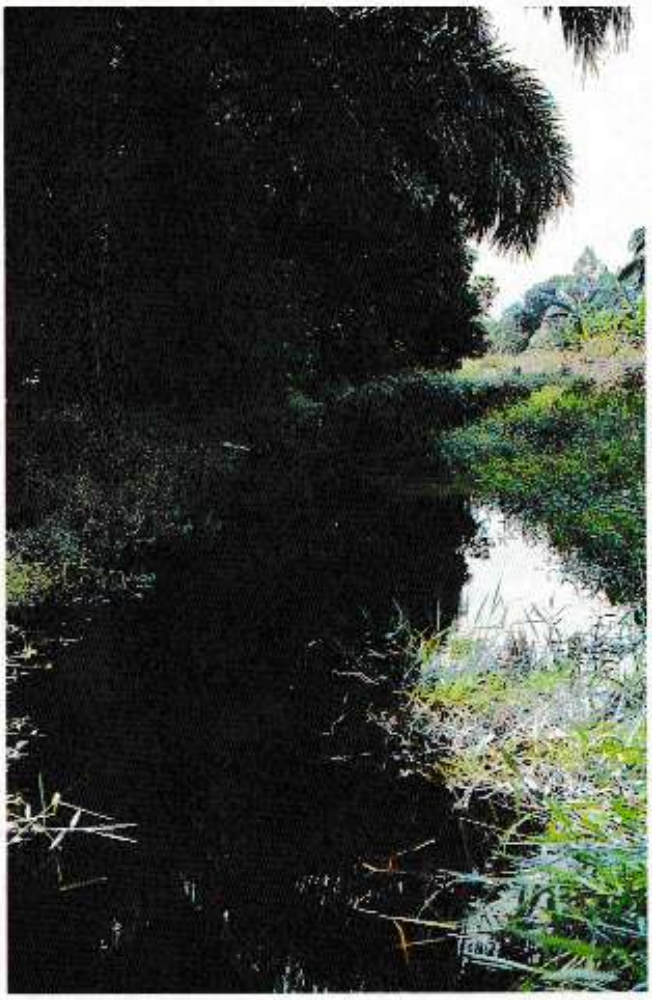
In my previous articles about labyrinths in Malaysia (*A&P*, February and July 1995) I bemoaned the loss of the peat swamp forests which harbour some of the most interesting anabantoids in Southeast Asia. When these are cleared very often the areas are redeveloped for agriculture, frequently for palm oil, which still is very important to the Malaysian economy. Since these plantations are likely to replace much of the natural lowland rainforest, its important to know which, if any, of our aquarium favourites will survive in the altered habitats so in this article I want to describe my experiences there.

I discovered that public holidays were not a good time to travel in Malaysia as I attempted to find a site for Parosphronemus near Kotta Tinghi, on the advice of Peter Ng of

Singapore University.

Missing my turning I took an indirect route, turning right off the R1 at Kulai and fished a swiftly-flowing stream which contained half-beaks, Tiger Barbs, Coolie Loaches and small Stream Loaches. The inhabitants of this upland stream made quite a contrast from the fauna of the lowland coastal areas that I had fished so far.

There was a traffic jam outside Kotta Tinghi and a constant stream of traffic on the road to the sea-side but before long, I was sitting in my underpants in my car in a Southeast Asian downpour, towelling myself down and listening to the World Service, hoping that the rain would slacken enough to let me return to the palm-plantation, just off the road to Desaru which Peter had identified as a Parosphronemus habitat. Sadly, I did not find any in this clear-water habitat which abounded with Rasboras. I did disturb a large Monitor Lizard which startled me by jumping out of the bush that I was currently abusing in the hope of detecting some desirable fish. It landed in the water with an enormous splash and swam rapidly downstream. However, my perseverance



Habitat of unnamed 'red' *Parosphronemus* from Pontian.

B. imbellis from its habitat found on the road to Pontian.

was rewarded by *Betta pugnax* which were found in shallow water in a tangle of roots. What with the downpour and the fact that I had fallen into the stream on at least two occasions my money and passport were somewhat soggy and water-stained and the latter was handled with some disdain by the Singapore authorities as I drove back to my Singapore hotel.

A few days later I headed toward Pontian from Singapore with Heok Hui Tan, searching for another of Peter's Parosphronemus habitats. Unfortunately it is now bordered by an industrial development and waste water was flowing into it from some houses on the other side of the stream.

This was brown-water rather than black but we were not successful in our quest here. Instead we fished more brown-water streams in the area, one fringing, the other inside, a palm plantation. In the former, Heok Hui caught a couple of Pikeheads, *Luciocephalus*, while I summoned up the last of my physical resources (ie, took a breather!) Although they have a reputation as difficult aquarium subjects (see Fact Box) I kept two specimens in a seven litre tank with no filtration for several months — at least, until the larger ate the smaller one evening!

Inside the plantation it was very dark and the brown water was streaked with an oily deposit.

Nevertheless, we found *Trichopsis vittatus*, *Anabas*, *Trichogaster trichopterus* as well as *Betta bellica* and some very nice *Betta imbellis*. One of the latter, in particular, had particularly splendid metallic scales on its flanks. Finding seven species of labyrinthfish in this oil palm monoculture shows that our adaptable anabantoids can co-exist with agriculture, although the ability of Liquorice Gouramies and the *B. coccina* group to compete in these habitats, has to be doubted.

Peninsular Palm Plantations

Betta pugnax

This 10cm species is not so much one fish as a species complex, characterised by iridescent blue/green scales on the flanks and throat. Representatives come from Thailand and throughout Indonesia as well as Malaysia. It is a mouthbrooder in which the male retains the eggs in his mouth for about 10 days. They spawn near the base of the aquarium and the female picks up the eggs from the male's anal fin and the floor and spits them out for him to catch. Frequently this develops into quite a tennis match as he spits them back or fails to pick them up, whereupon she has to repeat the action.

They require water between 22-26°C, the higher temperature for spawning, and soft, slightly acid water will suffice. The tank need hiding places for the male as the females are often ready to breed before he has spat out the eggs. Two males to each female ensures she has someone else to worry. The fry are quite large when spat out and will take brine shrimp and other larger foods immediately.

POSTSCRIPT

Three years later I revisited the habitats described above, once more with Heok Hui but also accompanied by Tony Pinto, a Betta enthusiast from the USA. Armed with more precise information we revisited the habitats to find the Liquorice Gouramies that eluded me in 1994. On the road to Pontian we climbed into the cool blackwater to find the grass, overhanging the bank to be teaming with a red variety of *Parosphronemus*. Moderate numbers of Chocolate Gourami were also present.

Such was my enthusiasm that I was happy to fish with the water up to my chest, despite the presence of a toilet overhanging the stream, fortunately downstream of us! The whole of this area was once peat swamp but now it was almost wholly palm plantation. Despite the optimism of the discovery that can exist with palm, it was a little disturbing to hear that no other populations of this variety were known.

A day later, accompanied by catfish student Ng Heok Hui, we found the 'Blue' *Parosphronemus* location near Kotta Tinghi. We were rather subdued, having just found that a once pristine forest habitat on the Kota Tinghi-Mersing road, previously home to *Betta tomi*, one of the 'Big

Unnamed red *Parosphronemus* from Pontian.

Luciocephalus pulcher

This voracious predator which occurs throughout Southeast Asia, including Sumatra, Malaysia and Borneo can grow to 18cm and is a typical ambush predator. When it attacks, it extends its hugely protrusible mouth over the prey. Only recently has it been replaced in the anabantoid family, rather than occupying a family of its own as it shares a well-developed labyrinth organ for air respiration.

This species is a mouthbrooder, which suggests a relationship to Chocolate Gouramies (Sphaerichthys) and Ctenops. It should be kept in soft, acid water (pH 5.0) but this makes it susceptible to disease, so scrupulous water conditions are recommended. They will only eat live food, which means small fish, shrimps and maybe mosquito larvae for young fish. Pairs spawn near the aquarium base, circling without apparently embracing and the male then takes the eggs into his mouth and can mouthbrood for up to a month and spit out 100 fry which will be big enough to take Brine Shrimp and larval fish.

Yellow Bettas', was under attack from 'development'. It was so heavily silted up that its previous fish diversity had largely disappeared. However, on the edge of a palm plantation, we soon found ourselves literally up to our neck in the cool water, where we found just three Liquorice Gouramies along with Pristolepsis sp., *Betta pugnax* and a large swarm of *Channa lucius* fry.

Once again, although reassuring to find that the denizens of the peat swamp forest could survive at the fringes of cultivation, the decrease in the population was rather disturbing, even more so when I saw Paras from Kotta Tinghi on a Tai Pai dealer's list!

FOR FURTHER INFORMATION ON LABYRINTHFISH SEND AN SAE TO:
AAGB,
C/O 19 CHILTERN CRESCENT,
SPROTBROUGH,
DONCASTER DN5 7PE

Betta imbellis

This small 5cm fighting fish is the peaceful alternative to the better-known Siamese fighter, B.splendens. It is commonly known as the Peaceful, or Crescent, Betta, the latter on account of the red crescent in the caudal. This little bubblenester is found in Sumatra and Thailand as well as Malaysia, where many distinct forms are known from different localities.

Breeding is as straightforward as with the Siamese Fighter. They will be happy in a 24in (60cm) tank, in fact several pairs can be kept together, around 24°C for maintenance and a couple of degrees higher for breeding. The water should be soft and just acid (pH 6.5-7.0). Bubble nests are built at or close to the surface so floating plants are useful for anchorage. The embrace occurs beneath the nest and the sinking eggs are placed there by both male and female. The fry may take three days to hatch and swim free at which time they require the smallest live foods such as infusoria.

Caught in the Net

Kathy Jinkings trawls cyberspace

Killifish are deservedly very popular, in spite of the fact that very few shops seem to stock these glittering jewels. As well as being very beautiful their interesting spawning habits and small size make them of interest not only to the already convinced Killifish keeper, but also to anyone wanting to try something a bit different'. The web offers a wealth of information about these fish, in addition to the newsgroups and mailing lists mentioned in last month's Caught in the Net.

At the American Killifish Association site, at **http://www.aka.org/**, is an extensive site with a variety of information. Killidata 96, a database of Killifish by geographical area and species, is available completely on line so that you don't need to buy the book if you just want to look something up. There are also excellent photos of a vast array of Killies, including recent discoveries; most species have more than one photo so that you can compare several fish from different locations. Yet another mailing list is hosted here, Killietalk. It is easy to join, just by filling in a form on the website and clicking the subscribe button. If you don't want to join, you can still click to browse the archives and read what the mail list members have been talking about. There is an online beginners guide for anyone just starting out with Killies, an online shop where you can buy Killifish books, and introductory articles on different Killifish genera and suitable foods and their culture. The news sections, from both Europe and 'Down Under', include dates for shows and conventions, new club information, and accounts of collecting trips. This is an excellent site for anyone interested in Killies, at any level of experience, with information for everyone from the absolute beginner to the expert.

If that isn't enough for you, the links page leads on to a large array of links, including both Killifish-specific sites and some of more general interest. Clicking a link here leads us on to the International Killifish Association pages, at **http://www.killi.net/**. The first page immediately catches the eye, with a selection of beautiful Killie photographs. On clicking the enter button, the surfer enters an area packed with more information, presented as an introductory article with text links to a deeper explanation of each of the topics. Having read the article you can move on to investigate more fully spawning behaviours, Killiefish maintenance, live foods, the Cyprinodontiform family, mosquito control, species information. This is a very easy and natural way to navigate through the area, as you are naturally led to investigate the topics by the introduction. In addition, a set of links at the top of the page allow you to navigate directly to species lists, picture galleries, and news and announcements.

Nearer to home, the British Killifish Association has their information hosted at the British Aquatic Resource Centre site, **http://www.cfkc.demon.co.uk**. You will find information about the BKA themselves, and how to join, in the Club House, while the library contains a wide range of Killifish articles ranging from introductory information to specific species articles.

The South American Annual and Rivulus Study Group, at **http://biodec.wustl.edu/~hrbek/SAindex.html**, has a wide variety of articles. Collecting trips, different species, keeping and breeding Killies are all dealt with in depth. The newsletter, 'Agua Tropica', is also fully online, with even more information. This site may seem a little daunting to the beginner, with some extremely advanced and technical information available, however, there really is something here for everyone, and the pages are well worth browsing.

Killifish Online, at **http://ourworld.compuserve.com/homepages/DRLee/**, claims to be the UK's first and brightest site devoted to Killifish. It's certainly bright, and well worth a look. Here you will find quick and easy information for the beginner — some tips on keeping Killies, a list of species recommended for the beginner to try, and reviews of Killifish books.

The Killie Dome, at **http://www.geocities.com/RainForest/Vines/1647/killi.htm**, is a home page that contains a useful introduction to Killifish, as well as a Killifish FAQ (Frequently Asked Questions). The egg exchange page is a place for Killifish fans to swap, sell or buy eggs, and has postings from people all over the world. As Killifish eggs can easily be sent by post this is your opportunity to get Killifish that may be hard to obtain or unusual in the UK.

Stephen Boulet's Killi page, **http://members.aol.com/stephenbou/killis.html**, is a well-constructed home page about his Killifish. The photos are very good, so it is nice to see that he has included an article explaining how he took them. These pictures are well worth seeing, and perhaps you will be inspired to take some of your own! Stephen has pages about some of the other fish he keeps as well, which you can reach by the 'back to the fish page' link.

The Aurizza mailing list page is the home page of a mailing list devoted to Killies. Here you can get digests of all the conversations from the mailing list. The strange Aurizza name comes from the internet codes for Australia, New Zealand and South Africa, whose Killie keepers the mailing list is intended for. Unfortunately a large number of links from this page appear to be to expired sites.

The Banded Killifish (*Fundulus diaphanus*) is an endangered inhabitant of South Dakota. At **http://www.npsc.nbs.gov/resource/distr/others/sdrare/species/funddiap.htm** you can read about the species and see a picture. There is also a map showing collection sites for the fish, although one wonders if this may be counterproductive for an endangered species!

The Desert Fishes Council at **http://www.utexas.edu/depts/tnhc/.www/fish/dfc/dfc_top.html** has featured in *Caught in the Net* before for its excellent coverage of other species. You will also find information on the pupfish there, including a video. This is a 2Mb download, so is only for pupfish lovers. By clicking on fish species and pictures above the map you will find a long index of all the fishes, including the pupfish. The strange links code translates as 'A', article, 'P', picture, 'M', map, while 'xtx' links to the Endangered Fishes Information system. Anyone interested in the pupfish should plan on a long visit here.

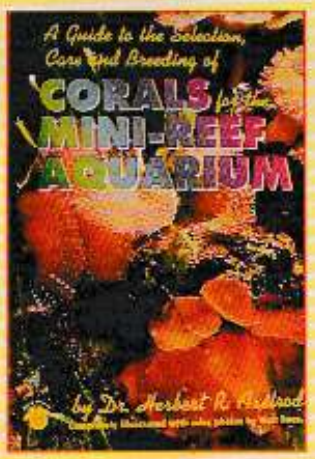
Next month we will be looking at the fascinating cichlids and all the sites devoted to them on the web.

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

BOOK REVIEW

Corals for the Mini-Reef Aquarium

Author: **Dr Herbert R. Axelrod**
Publisher: **TFH**
Price: **£27.95**
ISBN: **0-7938-0500-7**



Opening this book is like walking into a magic aquatic kingdom. Just imagine Dr Axelrod said: 'Open Sesame', and you're there.

Obviously the initial impact is visual thanks not only to the invertebrates' own inherent beauty and Walt Deas' skill in capturing them on film but also due to the Foto-Glaze technique employed in presenting the photographs on the page — they almost leap off the page.

Was this book necessary, practicable or even desirable were but three questions the author put to himself during the 40 years it took to finally produce it. Why the soul-searching? Well, would you want to (or even should you) create a demand for animals whose habitat you might help to destroy during collection, or for animals whose identities you weren't even sure about or whether they would survive in captivity anyway?

That this book actually made it to the shelves is a tribute to many things — patience for a start — but also the fact that much more public awareness has been brought about in respect of conservation matters and responsible collecting techniques, there is also much more positive identification nowadays and, of course, much more has been learned about the keeping (and culturing) of the animals in captivity.

Part of the mystery is just what is a coral? This fact is addressed extremely comprehensively in the opening chapter of the book, also what corals eat and their dependence (by many species) on algae; whether they are hard bony-fingered types or more horizontally-disposed 'plates' is also considered as is the increasing possibilities of breeding your own corals.

Moving on to the main section — the species catalogue — each species is shown photographically by an overall view plus a much detailed presentation of the animal's own particular identifying characteristic, along with the scientific name there is also a 'Common' name which may be no more than an invention based on appearance. A caption panel for each species photograph includes important culturing parameters as lighting needs, feeding details, space requirements and amount of water movement appreciated. Growth rate, compatibility and inclusion (or not) with fishes is also noted where pertinent. TFH publications have always been noted for their colourful impact but this has been put to good use in this respect: each 'cultivation notes' panel is not just on a coloured background for the sake of it — each of the three chosen colours means something: green means OK for beginners, yellow for the more experienced and red for experts. Thus, at-a-glance advice is available before you get your ambitions, or hopes, too high!

But, you might say, not all corals are hard. Have no fear, Soft Corals are also included in their own section as are the Gorgonians and it is these two groups which bring to book to a stunningly colourful conclusion.

There is a brief chapter on coral care which gives the very basic requirements but the subject is still very much in its infancy and with the culturing hints being given right where you need them most — alongside the relevant species — there need be no criticism of this section's brevity.

As coral culture is such a relatively new subject a short Bibliography directs you to more coral-related publications whilst the Glossary is especially valuable in reminding of the meaning of many words which will be unfamiliar, however, thanks to the appeal of this book, this situation will not remain so for any length of time.

DICK MILLS

SHORE WATCH

BY
ANDY HORTON

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

PLYMOUTH CITADEL MARINE AQUARIUM

I was fortunate to be able to make another visit to the Marine Biological Association of the UK Marine Aquarium at Citadel Hill, Plymouth, this winter. This has always been one of my favourite Public Aquaria and this visit would probably be my last one as the Aquarium is due to close this spring to be replaced by the new modern and much larger National Marine Aquarium as part of a new development in the Sutton Harbour area of Plymouth.

One of the reasons I liked this particular Aquarium was because it is simply laid out like a museum without any gimmicks and distractions. Secondly, the choice of the fish and other animals on display often included some of the rarer creatures not on display elsewhere. It is still the only aquarium where I have seen the Sea Cucumber called the Cotton Spinner, *Holothuria forskali*, on display in a tank on its own.

The original Aquarium was built in 1888, but this was dismantled and replaced by the present Aquarium and opened to the public in June 1959. The original tanks were made with cement, slate and glass, and over the years they needed frequent maintenance and leak stopping.

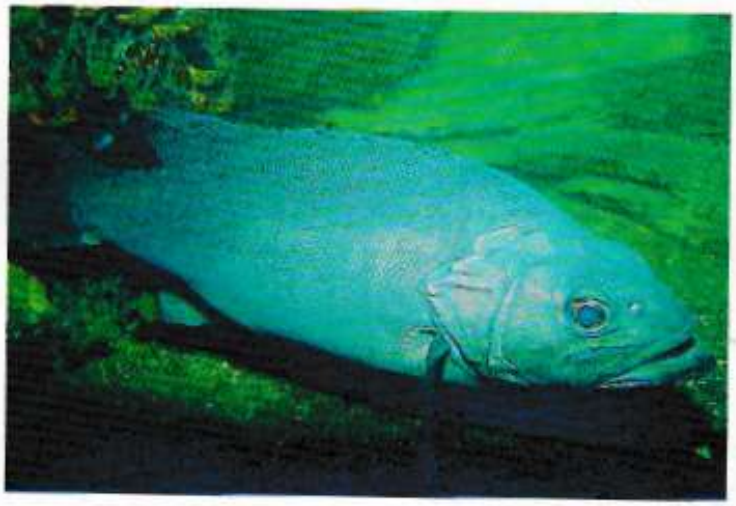
BRIGHTON SEA LIFE CENTRE

The Sea Life Centre Group has taken over the old Brighton Aquarium which was originally built in 1872. Marcus Goodsir, Displays Curator, showed me around the new centre and this was the first time I had visited it since the new shark tunnel was built in 1992. The old Aquarium has been refurbished with the atmosphere of the Victorian Aquarium retained with some unique old fashioned tanks in the centre of the wide aisles and it is these small tanks that the visitor is most likely to come across.

Initially there does not seem to be much in these tanks. There is a sandy area and a bed of Mussels. However, looking carefully into the tank reveals some flatfish changing colour from black to sandy colour depending whether they were swimming over the Mussels or the sand. Buried in the sand were scores of the Lesser Weever, *Echiichthys vipera*, the fish with a venomous black dorsal fin. Marcus fed them on some Freshwater Prawn and they suddenly darted out from their buried positions and eagerly gobbled up the live food. This behaviour demonstrated to anyone wishing to keep this fish in a home aquarium the speed that they can move in short bursts, and the possible

This large Wreckfish, Polyprion americanus, on display at the old Plymouth aquarium, is expected to be transferred to the New National Aquarium in the city, which will open in the Spring. This Grouper-like fish obtained its name for its tendency to accompany wreckage and is only an uncommon vagrant that it turns up in the seas in the south and west of Britain.

PHOTO: ANDY HORTON



danger of being stung. Needless to say the tank had a strong metal cage over the top to prevent youngsters poking their fingers in.

This was not the case with the open tanks with very shallow water and rock pool fishes like the Gobies and Blennies. These were not 'touch tanks' because there was a warning not to put your hands in the water.

Sterlets are part of the coldwater freshwater exhibit at Brighton Sea Life Centre with most of the British coarse fish on display. PHOTO: ANDY HORTON

KINGDOM OF THE SEA HORSE

For 1998 a brand new display of tank bred Sea Horses, including the British species, *Hippocampus ramulosus*, has been set up with the fish kept in cylindrical upright tanks. If you look very carefully you may be able to spot some of the baby Sea Horses that have been released from the male's pouch. It is also interesting to watch these fish swim, propelled by rapid undulations of the dorsal fin.

A special Jellyfish aquarium with specimens of the Moon Jelly, *Aurelia aurita*, proved interesting. There were a few display notices, but the information about the exhibits was generally rather sparse.

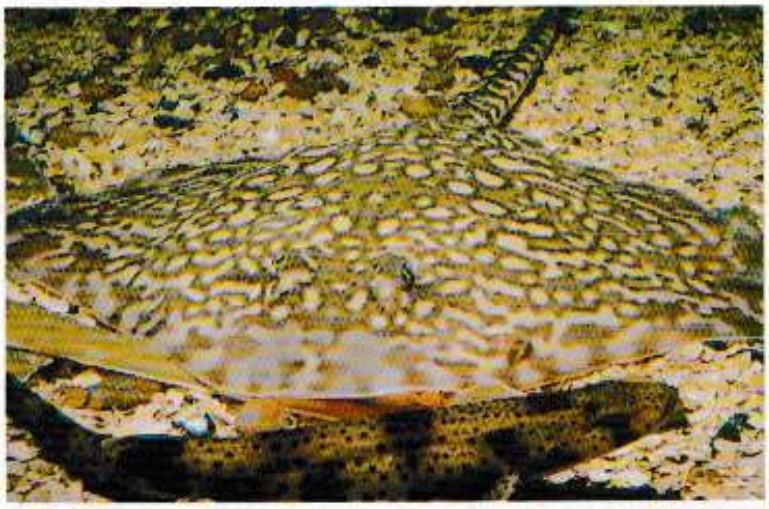
SHARK TUNNEL

A few visitors have been disappointed by the 'Shark Tunnel', having been seduced by the glamorous publicity and weaned on colourful television documentaries. The walkway reminds me of the crew's quarters on a merchant ship.

Tope, *Galeorhinus galeus*, a Shark found all around the British Isles and a streamlined predator that can grow to over 2m long, cruised in the large tank with a shoal of Atlantic Mackerel, *Scomber scombrus*. Mackerel are notoriously difficult to keep alive in Public Aquaria so this is the first time I had the opportunity to see this swift-swimming fish in anything like their natural environment.

In June 1997 a Tope with an estimated weight of 42kg was caught and returned by an angler at a mark called the Mixon Hole in the seas off Sussex. This Shark was dwarfed in size by a large unidentified Shark over 5m long weighing an estimated 500kg that was reported chasing Seals in Sandsound Voe on the western coast of the Shetland Isles in January 1998.

One of the best displays at Brighton Sea Life Centre is the display of Rays and Dogfish, with a wide selection that can be viewed from through the side of the glass and from above. PHOTO: ANDY HORTON



ROCKPOOLING IN MARCH

Overall my visit to Brighton Sea Life Centre stimulated my interest in marine life after the cold latent period over the winter when visits to a rocky shore can be disappointing. Blennies and Rock Gobies, Sea-Slugs and other invertebrates come inshore to breed during March and if you are lucky with the weather and the tides, March may prove to be a interesting month. On the east coast the 'rockpooler' is not likely to be so lucky and the Sussex coast can sometimes be drab and empty during the first three months of the year.

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.

Focus on PONDS & POND-KEEPING

All that Pea Soup – But No Bread!

devoid of oxygen. Thus, the water slowly flowing through to this filter has a low oxygen content (all used up by the previous active aerobic bacteria) when it reaches the anaerobic bacteria which then happily consume the oxygen content of the nitrate and reduce it eventually back to free nitrogen gas which re enters the atmosphere.

Vegetable filters are also employed to deprive the algae of nitrates. Here the method is to create a header pool, or a stream-like return from the main filter, which are then planted up with quick-growing plant life such as Water Cress. A pleasant by product of this approach is that you can eat the Water Cress.

Nitrate can also be diluted by regular partial water changes. This is essential anyway in the good husbandry of pondkeeping, as other dissolved pollutants that build up are also removed.

However, it is no good diluting with water that is enriched with nitrate. Tap water should be tested and a nitrate removal system employed if necessary. Unfortunately the price of these can be a bit daunting, although there are several alternatives, and once purchased they are there for good.

When water changing a good vacuuming of the pond bottom is essential (more expense), as any decaying matter is only exacerbating the situation. Dead and dying plant material will actually give up previously absorbed phosphates into the surrounding water ready to be taken up by the algae a very good reason for clearing out this debris before winter so that nutrients are not then available for the algae in the spring.

Another source of nutrient for the algae is the food that we ourselves put in for our fish. Overfeeding, both with leftover food and the waste products from that which is consumed — the more you put in, the more that must come out — can have an adverse effect on algae control.

Good quality food is, therefore, good for your fish, your water quality and your fight against the green fog. Overstocking, too many new additions too quickly, and under filtering, all contrive to add to your green water problems.

Cures

So if all preventative actions have failed, what are the cures? A time when this might be especially relevant is with a new pond. With the filter system not yet fully established, plant life at a minimum plus all that nitrate-thick tap water is an algae dream come true.

This might be the time to reach for the proprietary algicide. There are several on the market, follow the instructions, dilute first with a water change and vacuum away the dead algae after, and the results are quite good if only temporary.

I myself would prefer to settle for the water changes and then allow the pond and filter to mature, as I am always in favour of not throwing chemicals into the pond if not absolutely necessary.

The next weapon in your armoury is the Ultra Violet Unit, correctly installed in the plumbing of the filter system, the unit will coagulate the algae. This means that it is clumped together, enabling the filter to mechanically remove the problem, instead of allowing it to pass through as before.

Personally I think that the UV unit is the best and most effective piece of equipment in the fight against green water. Do remember that if you decide in favour of this investment to size the unit to suit your pond, and start each season with a new tube, as the expected life is only six months. Remember also to seek professional advice if unsure of the electrical installation. Having said that there are now low voltage units available. You can actually use a UV unit in the pond itself as there is a submersible version available but remember it must be used in conjunction with some form of filter system (yes, you can get submersible versions of these too!)

A more unusual cure that has often been offered, is to enlist the help of Swan Mussels.

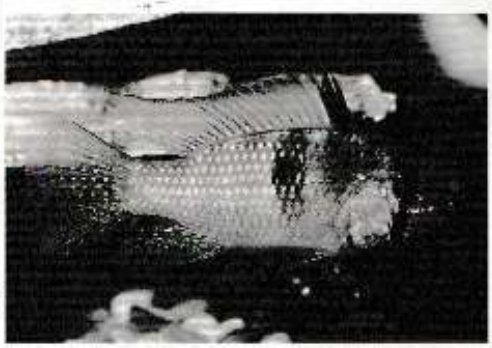
True, they do filter water naturally, but a vast number would be required to have any affect on the menace, also the larval stage of their life cycle is actually parasitic to fish.

Conclusion

These little green horrors that give us that dreaded pea soup, and cause our fish to disappear when just a few inches below the surface, can be a real pain. However, when understood and once you get to know your enemy they can be controlled or even eliminated.

Then you can have that dream of crystal clear water but then you may well start complaining about the extra rapid growth of Blanketweed — sometimes you think you just can't win!

LINCOLN & DISTRICT AQUARIST SOCIETY



Lincoln & District Aquarist Society has had its ups and downs like any other aquarium club in the country.

Today it has about a dozen keen and enthusiastic members who range from relative beginners in the hobby to people who have had aquarium fish virtually all their lives.

The Society meets every month at the Railway Social Club in Lincoln and discusses all aspects of the hobby. Breeding aquarium fish of all kinds is one aspect of the hobby which the membership is very interested in. Lectures and Table shows are held on a regular basis. Each year the Club holds an Open Show and Auction during the show season which is well attended. Last year Lincoln & D.A.S. won the Yorkshire Show League after a hard fought contest.

For further details about the club contact Jan and Peter Garner-Jones on 01522 501146.

Meet the Societies

The Federation of New Zealand Aquatic Societies (FNZAS) is currently made up of 18 clubs throughout New Zealand. Our aim is to encourage the fishkeeping hobby by sharing information and experiences. We also try and liaise with government departments on anything which may affect our hobby.

A Year Book is published, for members to be able to contact others with similar interests, and the *Aquarium World* magazine is produced quarterly.

The FNZAS also has an extensive video, slide, film and tape library. We hold an annual conference, always great fun, which enables members to meet one another in a social setting while learning more about fishkeeping and allied interests through discussions and workshops.

Our next conference is being hosted by the Hawkes Bay Aquarium Society in Napier, New Zealand, from 29 May/1 June 1998.

If you would like more information about the conference contact Kelly Rennell, 177 Guppy Road, Taradale, Napier, New Zealand, or e-mail kpr@clear.net.nz

For more information on the FNZAS (or perhaps contacts and places to visit in New Zealand) contact Caryl Simpson, 8a Faulkland Drive, Witherlea, Blenheim, New Zealand, or e-mail simtron@xtra.co.nz

SPECIAL FEATURE

Susan Brewer explains keeping and breeding Yellow-Bellied Toads

PHOTOGRAPHS BY THE AUTHOR

Yellow Perils

Yellow-Bellied Toads (*Bombina variegata*) are easy-to-keep amphibians with plenty of character.

Yellow-bellied Toad showing the vivid warning colours.

They might not have the instant 'ooh' appeal of their snazzy cousins but, even so, Yellow-bellied Toads (*Bombina variegata*) are easy-to-keep amphibians with plenty of character. It seems a shame that they are so often overlooked in favour of the brighter Oriental Fire-bellied Toads.

Yellow-bellied and Fire-bellied Toads are members of the Discoglossidae family, which means that they have a disc-shaped tongue and are, therefore, unable to extend it to catch their prey. Instead they lunge for their food and cram it into their mouths using their forelimbs; Midwife Toads and Painted Toads are also members of this family. The Yellows' natural habitat is central and southern Europe, in both low-lying and mountainous regions, and they frequent large ponds, medium pools or small puddles with equal equanimity. In winter they hibernate under stones or in holes, and when Spring comes they make the often long trek to their chosen stretch of water.

They grow to about 2in (5cm) long, and the colouring of their upper parts can vary from grey-brown to dark olive, an excellent camouflage which makes them quite difficult to spot in grass or murky water. However, as the name suggests, their bellies are a vivid canary-yellow with black markings — typical amphibian warning colours. This yellow colour extends to the underside of the fore and hind limbs, and when the Toads are swimming there are noticeable flashes of yellow, which presumably warn any sneaking predator, 'Keep off, I taste yukky'!

TOXIC FLUID SECRETION

Skins of Yellow-bellied Toads secrete a toxic fluid. If you handle the Toads it is important to wash your hands immediately afterwards, as the fluid can irritate human eyes. Some people have reported the Toads causing hay-fever like symptoms, but I've never experienced any problems. However, it's probably wise to keep them well away from young children.

Their defence posture is interesting. If threatened, the Toad will arch its back, cover its eyes with its front legs — palm out so that the yellow markings show – and fold its hind limbs over its back to display the soles of its feet, looking rather like a circus contortionist. The back seems to form a hollow, and some authorities refer to this as the 'boat' or 'canoe' position, but the Toads tend to lose this habit in captivity when they become used to their owner and to their new quarters.

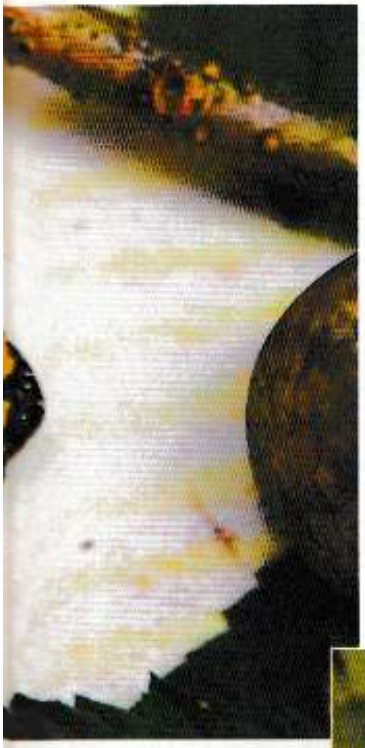
Because of the Yellows' poisonous nature it is probably better not to keep them in a mixed tank with other amphibians, except Bombina species.

SKIN TEXTURE DIFFERENCES

Apart from the colour, the most

obvious difference between the Yellows and the Fires, is that the skin of the former is much more warty: in fact, looked at closely, the back seems to be covered in minute spines, and is rough to the touch. Fire-bellied Toads have much smoother backs with a few round warts. Male Yellow-bellies can be distinguished from females by their more slender build, broader head and muscular forelimbs. In the breeding season dark patches appear on the inside of these limbs.

Yellow-bellied Toads prefer community life, and in captivity its best to aim for a minimum of three pairs,



as they're sociable little creatures. Therefore, in spite of their small size, they require a fairly large tank, and will normally sit together in small groups, often with a younger one sitting on an adult's back, presumably chatting about the weather, discussing politics or the latest state of play in the Test Match.

My own set-up, which has proved successful over the years, consists of a standard 36x12in (92x30cm) glass tank with one half sectioned by a 4x12in (10x 30cm) length of perspex, glued with aquarium sealant from front to back to form a shallow pond. This pond is floored with gravel and planted with Elodea. Two wooden ramps allow easy access to the water, and there is also a floating cork raft, which normally has a full complement of passengers. The remaining area is filled with a mixture of gravel and peat and covered with moss.

PROVIDE HIDING PLACES

Bark sections, stones, and small branches are attractive additions, providing hiding places for the inmates, and I've found that indoor plants, such as Begonia and Tradescantia, grow extremely well, look attractive and need little attention apart from regular pruning. Smaller Yellow-bellies sometimes manage to climb up the stems of the plants, but eventually they grow too heavy, and then can only make it to the first leaf.

Maintenance is simple; an occasional spraying of the plants with water, and a weekly siphoning of the pond to remove debris. Every three weeks or so, the pond is completely drained and refilled with fresh water.

My tank is unheated, but is kept at room temperature in a normal living room. It is lit by a 20 watt neon tube for 12 hours a day, and the temperature averages between 60-75°F (15.5-25°C), according to the time of year The lid is in two parts, one part consisting of a sheet of glass, and the other a muslin-covered wooden frame, to ensure adequate ventilation.

The Toads are easy to feed, taking small Crickets, Mealworms, Earthworms, Tubifex and Aphids, and are quite intelligent, soon learning where the feeding dish is, and gathering round hopefully for supper. They will also feed in the water, catching Gnat larvae and Daphnia. It's a good idea to regularly dust some of the food with a vitamin supplement, and to provide as varied a diet as possible.

Although Yellows don't seem to become as tame as some other Toads they rarely panic and will quickly investigate aphid-covered leaves and the like, even if their owner is still attached to the other end! They have bouncy personalities and, in some respects, seem more like Frogs than Toads.

MARVELLOUS VENTRILOQUISTS

Captive-kept Yellow-bellies will call throughout the year. The call of the male is a muffled 'yapping', rather like a puppy, which, though not that loud, carries well, often seeming to be coming from a completely different direction to the Toad! In fact, they would make marvellous ventriloquists, with their amazing voice-throwing abilities. The male will often float for hours in the water, with his head just showing and his legs out straight behind him, calling hopefully until a female finally approaches. She will be grasped firmly around the middle. If she isn't willing to mate, she trills a rejection call, a strange bubbling noise, vibrating her body. This usually causes the male to let go.

However, if she is willing, then

Defence position of the Yellow-bellied Toad.

she won't make a noise and the Toads will stay in amplexus (mating clasp) for several hours before egg-laying takes place, normally at night.

If you allow the Toads to breed in the community tank, you'll find that most of the tadpoles will be eaten. It's better to introduce a calling male into a totally aquatic set-up, placed in a sunny position although making sure that the tank has shade. Sunshine definitely seems to stimulate the Toads into breeding activity. Float a piece of cork or wood on the surface of the water, which will give the female somewhere to crawl to if she wants to escape the male's attentions. Add the female, and with luck, amplexus should take place within a few days.

Often the male is extremely vigorous, and the female will wriggle from his embrace, seemingly squashed, eventually falling exhausted to the base of the tank with her eyes shut.

However, she soon revives and goes back for more of the same! A word of warning — Yellow-bellied Toads will interbreed with Fire-bellied Toads, so if you keep a mixed community tank, be prepared for hybrids. It's best to separate the various species in the breeding season.

'IF IT'S THERE, LAY AN EGG ON IT'

Once the eggs are laid the parents can be returned to the main set-up and the young reared in the aquatic tank. The sticky eggs, light grey in colour and about 2mm in diameter, normally number between 10-70. They are scattered singly, or in small clumps, over plants, rocks, gravel, leaves, cork rafts, and anywhere else they can find. The Toads' motto probably is: 'If it's there, lay an egg on it'.

After a few days, depending on the water temperature, the pale putty-coloured tadpoles emerge and at first lie motionless digesting the remains of the eggs. Soon they begin to browse on the plants, searching for algae, and will gradually darken. They can be fed on infusoria, Daphnia, Tubifex and flake fish food. It is very important to keep their environment clean by siphoning debris and regularly part-changing the water.

After a month or so the tadpoles begin to metamorphose, and it's best to divide them between several tanks so that there is plenty of room for growth. Place stones or cork in the tanks so that the toadlets can crawl onto dry land, or build a gravel bank. Once the toadlets' tails have shrivelled, drain the water and line the tanks with damp tissue or moss. It is important to keep the young Toads moist at all times. Make sure that the tanks have tight fitting lids as at this stage they climb well and can adhere to glass, but as they grow heavier they lose this ability. The small plastic tanks with aerated fitted lids, often sold as 'pet carriers', make ideal living quarters for the young Toads, and the centre-opening flap makes feeding easy without risk of escape. Feed them on hatchling Crickets, aphids and Tubifex.

Other Fire-bellied Toads include the previously mentioned Oriental (*Bombina orientalis*), which is the brightest of the species and grows to 2½in (6cm). It has a black-blotched bright green back and a flame-red black-marked belly. Some specimens are really vivid, their colouring easily rivalling that of more exotic species. Often, though, after a few generations in captivity, the colours seem to get duller. This species is found in Eastern Siberia and China.

Yellow Perils

GENERALLY DRABBER

The Fire-bellied (*Bombina bombina*) Toad grows to around 2in (5cm) and is generally drabber than the above species. It has a green-spotted brown back and a bright orange/red black-blotched belly. Sometimes its back can be very dark, almost black. The skin is smoother than the Yellows', with the warts more rounded. This is an Eastern European species, sometimes overlapping with the Yellow-bellied Toad, but only found at low altitudes.

The Giant Fire-bellied (*Bombina maxima*) can grow to 3in (8cm). It is similar to the Oriental, but is more heavily-built, with a very warty back. It is another Asiatic species.

As Bombina species are some of the easiest amphibians to obtain, they are often kept by beginners new to the hobby of herpetology who seem to regard them as a stepping stone to the more unusual varieties. Yet they are fascinating little Toads in their own right, colourful, relatively easy to breed, and not noisy enough to disturb the neighbours. Next time you see a tank of Yellow-bellied Toads in your local dealer's, why not treat yourself to a few? I promise you'll not be disappointed by these cheerful little creatures!

Bombina species will interbreed — this should not be allowed to happen.

FACT FILE 1

Common Name: Yellow-bellied Toad
Scientific Name: *Bombina variegata*
Family: Discoglossidae
Distribution: Europe
Size: Male 2in (5cm) Female 2½in (6cm)
Colour: Brown above; yellow and black below
Disposition: Lively

FACT FILE 2

Vivarium: Reasonably large, minimum 24x12x12in (61x30x30cm)
Conditions: Moist, with pond, or aquatic with island
Temperature: 50-80°F (10-27°C)
Diet: Crickets, Insects, Mealworms, Earthworms
Breeding: Fairly easy

BUY LINES

NEW PRODUCT REVIEW

JUST WHAT FISHES ARE LOOKING FOR!

We've all heard the horror stories about parasites and other 'nasties' being introduced into aquariums with wild-caught live foods and most fishkeepers now play safe by using 'processed' live foods in frozen, freeze dried or preserved forms. However, it is always possible that if produced from contaminated original foods the risk still remains.

One of the most popular foods is Bloodworm and although purchases of contaminated food will lead to risk of disease you can now obtain this food (almost impossible to culture) from a source that can be relied upon — 100 per cent. These particular Bloodworms have been sterilised in a water solution with their body structure unaltered and their nutritional value intact.

Regular feeding Bloodworm to your fish (all fish love it) is very beneficial: it has a very high protein content and it provides enough amino acids to obviate the need for supplementary diets.

Moreover, if you are hoping to breed your fish Bloodworm is an important part of their diet to bring them into condition and to stimulate the reproductive mechanism prior to spawning. Again, all fish will benefit, although more specialised species such as Discus do appear to respond more positively.

Bloodworm is also an excellent way to beat a fish that appears to be on hunger strike for whatever reason — it may be in the early stages of an illness or simply stressed from that last outing to a Fish Show!

The Bloodworm range are packaged in vacuum-sealed jars and are available from Aqua Company Ltd.

You can feed this form of Bloodworm simply and safely — straight from the jar. The very strict sterilisation process completely destroys all harmful micro-organisms — which is not always the case with frozen Bloodworm. A 'hands-on' report from a Discus breeder found that fed straight from the jar involved no wastage and the jar was finished quickly; however, with less 'demand' the contents would have kept safely in the refrigerator for at least four weeks after opening. Two weeks after completing the feeding trials, no sign of water contamination or digestive disorders were found.

This new product is entirely flexible in its use for fishkeepers, no matter how many (or how few) fishes they keep. Available in three sizes — 100gm, 500gm and 3kg — makes it a practicable feeding proposition for owners of small tanks, pond owners and fish-breeders alike. The Bloodworm are packaged in vacuum-sealed jars and available by Mail Order. Prices are: £3x100gm, £9.95; 500gm jar, £10.50; 6x500gm jars, £28.05. All prices include postage and packing.

• Further information and an order form can be obtained by writing to: Aqua Company Ltd, Unit 3, Rake Industries, Rake, Petersfield, Hampshire GU31 5DU. Tel: 01730 892433. Fax: 01730 892488.

STOCK UP FOR SPRING, SAYS OMEGA

With spring just around the corner, the message for pond fish retailers from Omega is "stock up now or lose out on sales".

Omega Floating Pond Fish Pellets, part of a March offer.

Pond fish feed seasonally and increase their food intake in the spring when the weather warms up, presenting retailers with a distinct sales opportunity. To start off the season, Omega is offering pet trade retailers 15 per cent off large sacks of Omega Floating Pond Fish Pellets for the month of March.

It is important that pond fish are fed a nutritionally balanced, vitamin rich diet to keep them healthy throughout the year and Omega Floating Pond Fish pellets are a complete and balanced food, specially developed to contain the correct level of protein and nutrients for all types of pond fish, including Carp.

They have been fully cooked to aid digestibility, ensuring the absorption of essential nutrients such as Vitamin C, which helps to increase resistance to disease and improve the health and vitality of the fish.

They come in three sizes for different sizes of fish.

• For further information contact Louise Vint or John Meaking at Choat & Partners. Tel: 0171-373 4537.

Back to BASICS

The Cherry

Iggy Tavares, PhD

PHOTOGRAPHS BY THE AUTHOR USING A PENTAX Z-20 CAMERA

Colourful female Cherry Barb.

The Cherry Barb does best when kept with at least half a dozen of its kind. They then tend to be very playful.

When starting up a community tank one usually tends to look for small, colourful, active but peaceful fish. One species suitable for such a set-up is the Cherry Barb, a shoaling species that does best when kept with at least half a dozen of its kind. They then tend to be very playful, chasing each other, while males exhibit their brightest colours spar with each other but do little damage.

The Cherry barb, *Barbus titteya* (sometimes still referred to as *Capoeta titteya* or *Puntius titteya*) was first described in 1929 by Deraniyagala. It comes from the slow flowing streams of Sri Lanka (originally Ceylon) where the water is soft and slightly acidic and the banks overhang the water with vegetation.

This Barb, which only grows to about 1.5in (4cm) lives up to its common name as the male, when in the act of spawning, does become a deep red cherry colour. Generally males are quite red while females are paler in colour. Usually the back tends to be brown in both male and female but males tend to have red fins while in females these are almost colourless. Both male and female have a black horizontal stripe which runs from the snout to the tale base. Mature females are also plumper and easily discernible from males. The Cherry Barb does have a small barbel on each side of its mouth.

I suppose it had to happen sooner or later and an albino Cherry Barb is also now available! The albinos have red eyes, and the males do exhibit a deeper red colouration than females. The black horizontal band is substituted by a dark red band which does stand out from the rest of the body colour. I found these albinos to be much more active and vigorous that the normal wild type fish and also rather attractive. However, the natural wild-type fish is beautiful.

AQUARIUM SET-UP

A three foot aquarium is suitable for a community of small peaceful fish which could include a small shoal of Cherry Barbs. Bearing in mind its natural habitat a well-planted aquarium is suitable for this species. Although preferring soft acidic water with a pH of around 6.5, the Cherry Barb will tolerate hard water provided it is clean and well filtered. I therefore had no maintenance problems in the hard London water which I kept at around 26-28°C. Filtration was undergravel and partial

Barb

Albino female Cherry Barb.

water changes were performed every two weeks or so (25 to 40 per cent). The Cherry Barbs happily took flake food and I occasionally fed them some Whiteworm.

SPAWNING

My Cherry Barbs seemed to be frequently spawning around all sorts of plants in the community set-up where they were housed with other species. Naturally, all the eggs were soon eaten by the first fish to reach them. To successfully get fry, one has to set up a small breeding tank furnished with Java Moss or nylon wool mops. I find Java Moss best, but it is not always available. However, once you get a clump it will grow for years, with little care required. Another requirement is soft water — rain water, for example, with a pH 6.5-7.0. The eggs do not generally hatch in hard water. Males should be separated from females for about a week, while being well fed enabling the female to fill out with roe.

A male and female are usually introduced into the breeding tank in the evening. In the morning the male, who has by now turned a deep red, commences his courtship ritual which involves fin flaring and chasing. In the Java Moss the pair come together to release tiny clear eggs and milt. This is repeated many times which results in the laying of around 100 to 200 eggs. The parents need to be removed to prevent them eating their own eggs. With good feeding the pair should be ready to spawn again in less than two weeks.

At 28°C the eggs hatch in 24 hours, and the tiny fry are free swimming in about three days. Because they are so small the fry need infusoria initially and only a week or so later can larger foods such as Brine Shrimp, Microworm or even powdered flake foods be introduced. Frequent small water changes are required during this stage as well as the introduction of a mature sponge filter turning over at a slow rate as soon as foods are introduced into the aquarium.

Soon there should be a shoal of tiny Cherry Barbs swimming around.

CONCLUSIONS

The Cherry Barb, with its bright colour and small size has made it a popular fish for the last few decades. It is a peaceful species and does not possess the same boisterousness of its cousin, the Tiger Barb. Cherry barbs are shoaling fish which will add colour and spectacle to any aquarium. You might even want to give the albino Cherry Barb a try.

FACT FILE

Scientific Name: *Barbus titteya*
Distribution: Sri Lanka
Common Name: Cherry Barb
Size: Male and Female 1.75in (4cm) TL

AQUARIUM CARE

Aquarium size: 36x12x15in (90x30x37.5cm)
Aquarium decoration: Well-planted aquarium preferred (real or plastic plants)
Temperature: 26-28°C
Water: Soft preferred (pH 7.0, 5°DH approximately)
Diet: Flake food, some live or frozen food

Dave Garratt shakes up a veritable Seafood Cocktail

Crustaceans

Part 1

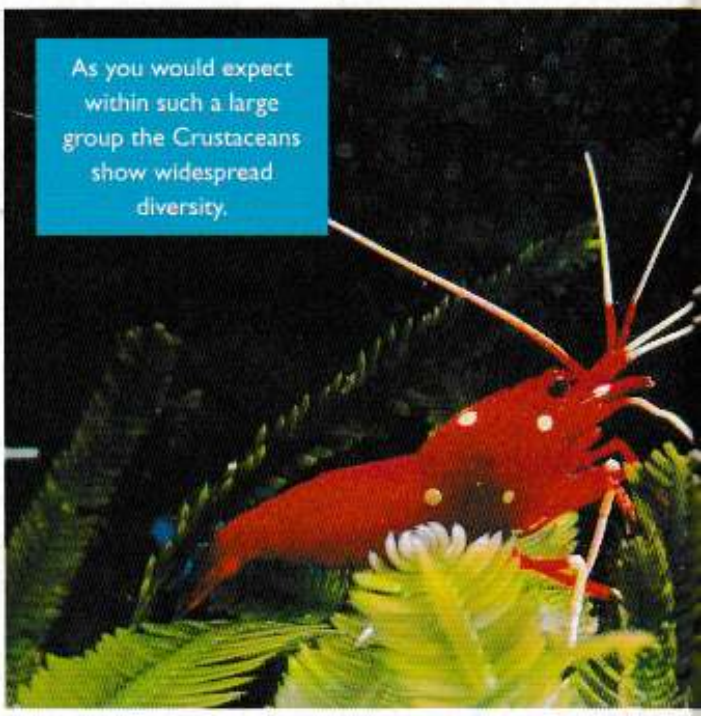
The Blood Shrimp, Lysmata debelius.

PHOTO: M.-P. & C. PIEDNOIR

INTRODUCTION

The Crustaceans represent an extremely large Phylum of animals containing over 40,000 species. With such a large Phylum one would expect a fair selection to be available to the hobby. Whilst it is obvious that only a small fraction will actually be available (or suitable) for the home aquarium they, nevertheless, present rather a tall order to remotely do justice to in a single short article.

With this in mind the article will be split over two issues. The first part tackles an overview of Crustaceans and how they fare in captivity. The rest of the article then focuses on a number of species that are available but not advisable for the mixed community aquarium, although some of them would make fascinating subjects in a tank of their own. Next month I will concentrate on the species that present less problems when searching for compatible tank-mates.



As you would expect within such a large group the Crustaceans show widespread diversity.

EXTREME DIVERSITY

As you would expect within such a large group the Crustaceans show widespread diversity. Their habitat is usually marine but can be freshwater — or even dry land. They exist from the shoreline to the ocean depths and across a range extending from arctic to tropical waters. Size is equally diverse with some Spider Crabs having shell lengths well over a foot in length and leg spans over six feet.

However, even Spider Crabs come in suitably small, aquarium sized versions. The relatively small number of species available to the hobby, nevertheless, show a wide diversity of life-styles, for example they can be small, peace-loving filter-feeders, efficient scavengers, or voracious aggressive predators.

THE TEN-LEGGED DECAPODS

The mainstay of species seen within the hobby usually belong to the Decapods. The Decapods are a group of Crustaceans characterised by the possession of five pairs of legs. They contain the Crabs, Shrimps and Lobsters that are commonly available to the hobbyist.

If a quick leg count is done on these ten-legged creatures they often appear to be missing a couple. This is because the front pair have often evolved to a non-walking function. This can be demonstrated by the familiar pincers of Crabs and the claws of Lobsters.

OPPOSABLE JAWS AND TOUGH SHELLS

Crustaceans have other features that distinguish them from other

invertebrates. They possess a pair of opposable pincer-like jaws known as mandibles. They work generally in a sideways motion to crush, shred and chew food, or they may even be adapted as blood-sucking implements in some species.

MOULTING — A MAJOR PROBLEM FOR CRUSTACEANS

Finally, the feature of Crustaceans that is probably best known to the aquarist is the fact that their soft bodies are protected by a tough outer shell known as the carapace.

However, this protective shell does not grow with the animal and thus needs to be discarded and replaced on a regular basis to allow for growth.

Shell sloughing, or moulting, presents a major problem for Crustaceans, both in the wild and in captivity. After the moult the new shell takes at least half a day to harden and during this time the soft bodied Crustacean is vulnerable to attack. The actual process of shell discard and renewal, ie, moulting, is the subject of much scientific debate. A simplified version suggests the shell begins to loosen from the skin surface below it, whilst a secretion partly dissolves the old shell. Underneath the old shell a new one forms and when it is complete the old shell breaks open at the breast section and the animal emerges. The new shell is soft and the animal takes in water to stretch this new pliable shell to its maximum extent. The shell then begins to harden and during this time the Crustacean will need to hide away in a crevice for protection, or as sometimes happens in the wild it will rely on its partner for protection. Young animals will moult more frequently than older ones because of the faster growth rate of the young.

The shells of differing Crustaceans show differing degrees of hardness according to the amount of calcium carbonate in the shell. Helmut Debelius states that the dry weight of a Prawn shell is 77 per cent organic material and as such the shell is relatively soft. He compares this with figures of 29 per cent and 38 per cent respectively for Shrimp and Crab. Therefore, these shells are considerably harder as the organic content is low compared to the content of calcium carbonate and other minerals such as magnesium carbonate.

Sometimes a moult does not go according to plan and the old shell may not fully separate, the chances of the Crustacean then avoiding predators is almost zero. Sometimes just part of the shell may become stuck, for example a single leg. If this occurs the Crustacean exhibits yet another remarkable trait, self-amputation! The leg is automatically severed and will be replaced at the next moult. This phenomenon, which is also used as a last resort to escape a predator, has been observed within the aquarium.

INCREASED MOULTING PROBLEMS IN CAPTIVITY

Moulting can be a particular problem for the aquarist, it is certainly a time of high mortality rates for Crustaceans in captivity. The complicated moulting process is governed by hormones but also relies on many other factors such as: release of the moulting fluid, uptake of minerals from the tank water, and the intake of water after moulting. The environmental factors of light and temperature are also known to affect the moult. It can be seen that diet and water quality will have a huge impact on this delicate process. To add to the problems of moulting in an aquarium is the close proximity of potential predators when the shell is soft.

COMPATIBILITY

Again the sheer diversity of the Crustaceans can give rise to problems for the aquarist. Some stunning species can be kept but only as the sole inhabitant of a tank or by being housed with equally dangerous tank mates. As will be shown later problematic species can be added unwittingly to the aquarium. The rest of

During moulting this Chameleon Shrimp is at considerable risk from predators.

PHOTO: M.-P. & C. PIEDNOIR

this feature will concentrate on these potential problems.

CRABS

There are many species of Crab available within the hobby varying through a large range of sizes and modes of existence. Small unidentified species or small innocuous looking specimens of the *Macropipus* genus may be unwittingly introduced into the aquarium with living rock. However, these crabs, known as Swimming Crabs, grow very quickly and, as their name suggests, are capable of free-swimming, being able to pursue and catch small fish. There are other species of quick growing predatory crabs that cannot be kept with small fish or invertebrates. Leave these crabs, or any unidentified species, well alone, they are not for the community tank.

Even the ever popular Hermit Crab can give compatibility problems. Whilst some are tiny species suitable for inclusion with the most delicate of invertebrates, some species grow to large fist size specimens that can be very destructive, or even predatory, and therefore only suited to a fish only tank of suitably sized fish.

Conversely the smaller, peaceful crabs (see next month's Part 2) available to the hobbyist do not have shells capable of withstanding the attentions of large Triggerfish. Neither could they survive with one of their natural predators such as a Pufferfish or large Wrasse. Choice of tank-mates must always be given serious thought.

SHRIMPS

Like the crabs there is tremendous variety, even between the relative few species seen within the hobby. There are colourful, peaceful species, species with rather specific eating habits and armour plated warriors that cannot be trusted with other tank-mates.

Crustaceans

Some of the species for the hobbyist to avoid are also some of the most startling members of the Phylum. A prime example are the beautiful and bizarrely patterned Harlequin Shrimps of the *Hymenocera* genus. Their dietary requirements are so restrictive as to render them unsuitable for home aquarium. They present a problem rather like the Angelfish that can only exist on Coral Polyps. These Shrimps require a diet of live Starfish, which even if the aquarist has no qualms about providing, would be rather difficult to sustain in the long term.

Another other potential problematic shrimp must be one of the most striking invertebrates ever seen in a marine aquarium, ie, the Green Mantis Shrimp, *Odontodactylus scyllarus*. The Shrimp is basically deep-green, with hints of red and yellow mixing into a mottled effect. The heavily-plated segmented body adds to the overall effect — beauty or the beast — depending on your point of view.

What is not open to debate is its skill and voracity as a predator. The Shrimp is capable of propulsion and can, therefore, swim to catch prey. It has also perfected a more leisurely 'lying in wait ambush' approach. They are extremely efficient hunters quite capable of killing fish and crustaceans larger than themselves, which is a problem as they can attain lengths of 6in or more in an aquarium. Victims are speared by a specialised appendage or are clubbed to death by hinged club-like limbs. The impact is said to be equivalent to a 22mm bullet and they have been known to smash through the walls of aquaria.

Other species of Mantis Shrimp may prove a similar problem to the one seen with the small Swimming Crabs. Like them, it is easy to unwittingly introduce them into an establish reef aquaria when adding living rock. Catching a Shrimp or Crab without having to dismantle the entire artificial reef can be a major headache. Traps have been devised and sold by enterprising retailers, or the aquarist can make their own. A home made one would consist of a deep plastic tub baited with a piece of Cockle or Mussel, with a small hole in its lid. The theory being the unwanted invertebrate is attracted to the food and can gain easy access but has great difficulty in escaping. I have used another ploy to remove an unwanted Mantis Shrimp from my own reef tank. I purchased a small piece of tufa rock into which I carved out a couple of small holes. I baited the holes with food and began a patient wait. The rock needed removing and baiting on more than one occasion.

Finally, when curiosity and/or hunger got the better of the Shrimp he explored the rock which, when I was lucky enough to be observing at the time, I promptly removed.

Apart from the problematic species listed above Shrimps provide one of the mainstay invertebrates of the hobby. A number of small, peaceful, suitable species will be examined next month.

LOBSTERS

Large Lobsters such of the *Homarus* genus are fearsome predators unsuited for the community aquarium. The Spiny Lobsters, or Crayfish, of the *Panulirus* genus grow far to large for the home aquarium. However, there is a group of very colourful Lobsters that are eminently suitable for the home aquarium, Reef Lobsters, which will be reviewed next month.

Part Two of this article will look at the wide range of Crustaceans and their aquarium care. Crabs, Shrimps and Reef Lobsters suitable for the mixed aquarium will be discussed.

Hermit Crab with its current 'Dos Ros' on board.

PHOTO: LINDA LEWIS

FRY TALK

HELEN STEELE

Welcome to the Junior Page in A&F. I will be ably assisted by Lizzie who will tell me what you want to read about, as she, too, is a Junior. "Who are you?" I hear you ask. My name is Helen and I am a teacher of mostly junior children, spending much of my spare time working in our own fish-house (as you can see above!)

I look forward to hearing from you all with your articles, ideas and questions. Why not set a Quiz for the experts or ask for information about breeding a particular type of fish? I am ready to receive all your correspondence and will do my best to provide you with what you want!

Happy Fishkeeping

David Marshall has sent us this report from his Society — many thanks, David, we were delighted to hear about your Juniors' activities ... keep up the good work!

As part of their 1998 AGM, the Committee of Ryedale Aquarist Society, based at Pickering in North Yorkshire, decided to put on a Painting Competition for their Junior Members. The youngsters submitted a painting of their favourite fishes, all of which will be displayed at our Stand at the forthcoming Yorkshire Aquarist Festival.

The competition to find a winner was very intense. The task of judging them was given to a well-respected, local aquarist, Mr Gerry Hawkesby, who awarded the first three Places as follows:

1st Miss Laura Campion (aged 13)

2nd Miss Rachel Campion (aged 11)

3rd Master Jake Read (aged 5)

All the children taking part received aquatic items kindly donated by Aquarian and Sinclair (King British) Animal Care. All of the above-mentioned children, and several others who submitted paintings, are members of the National Junior Fishkeepers Association.

All at Ryedale A.S. wish you every success with your new column and if we have any more Junior 'bits and pieces' you can be sure that we will let you know about them.

Juniors in the area can find out more about Ryedale A.S. by contacting David Marshall on 01751 472715.

Our Visit to Maryport Aquaria, by Lizzy and Hilary Porter

This month, Lizzy, Hilary and I went on a day trip to Maryport Aquaria which is about 25 miles away from Seascale.

The Aquaria is situated on the Marina at Maryport and is well worth a visit. Why not give it a try if you are coming up to the Lake District for the Easter Holidays? The girls interviewed Mark Voellers, the proprietor of the Aquaria, and asked him many searching questions. We learned that the water for all the tanks and features was pumped out of the harbour into storage tanks where it is allowed to settle before being used. We also discovered that the 'inmates' do not like things too hot and this can create problems.

Here is the girls' report:

During the recent Christmas break we decided to make the most of the time off school by visiting local Maryport Aquaria, situated just up the coast from our home in Seascale. All the fish and other water life found in the aquaria is wild-caught from the local Solway Firth.

The tour through the Aquaria takes you on a trip from the salt marshland of the Solway Estuary to the harbour in Maryport. The tanks containing many interesting local species of fish and crustaceans are clearly labelled so you know exactly what you are looking at, also all round the Aquaria are boards with facts about the area and habitat in which the fish live.

Part of the Aquaria is housed in a recreation of a shipwreck and the light and fish swimming round you really makes you feel like you're wandering around in the watery depths! Also all around the Aquaria you can hear the crashing of waves against the rocks in the wave tank housing a giant Crawfish thought to be in excess of 20 years old!

The Aquaria also offers a 'hands on' area where visitors can look and touch creatures found in the rock pools round the coast such as small Crabs, Starfish and saltwater shell-dwellers such as Periwinkles and other invertebrates. Also the braver visitors can stroke the Rays in a large tank with some of the smaller varieties of Shark found swimming offshore locally.

The other features include tanks of the fish bred in the aquarium such as Dogfish and how they are spawned and hatched in captivity. When you have seen all there is to see there is a Cafe and Gift Shop where you can buy a reminder of your trip. We enjoyed our visit very much and would recommend anyone living nearby (and those visiting the area) to pay a call.

Maryport Aquaria is open all year round. Admission charges are: Adults, £3.80; Seniors, £3.00; Kids, £2.80; Family (2+2), £12.00; Family (2+3), £14.50. Children five years and under get in free. Special rates for groups of 10 or more, you can even have birthday parties and evening functions there. School Educational Pack available on booking.

Maryport Aquaria is located at South Quay, Maryport, Cumbria CA15 8AB. Tel/Fax: 01900 817760.

THAT'S ALL FOR THIS MONTH, JUNIORS, BUT DO KEEP ME INFORMED ABOUT YOUR FISHKEEPING ACTIVITIES!

A view of one of the displays at Maryport Aquaria.

Sharks and Seahorses Settle in Plymouth

The world's oldest living predator, the Shark, and one of the most endangered species, the Seahorse, will make their homes alongside hundreds of other marine animals at a new, state-of-the-art aquarium in Plymouth on the quayside overlooking Plymouth Sound and the historic Barbican.

Opening in May 1998 the National Marine Aquarium will be Britain's first world-class aquarium, pumping millions of gallons of sea water direct from Plymouth Sound.

Visitors will take a journey through the vast oceans of the world from the British shoreline to the Deep Atlantic and the warm Coral Seas of the Caribbean and the Indo-Pacific, seeing many types of marine animals in their natural habitats along the way.

At the beginning of the experience in an area of mountain streams and estuaries which resemble a Dartmoor scene the salmon's journey up and down the river system is seen via a 3m deep plunge pool at the foot of a waterfall. In the Shore and Shallow Sea section, a 5m wave tank and Interactive Discovery Pools give the children the chance to see marine life of the shallow seas in close up. This exhibit also houses the UK's largest display of Seahorses, a seriously-endangered species on which much pioneering work is being carried out by the National Marine Aquarium's team of experts.

In the Deep Reef, the biggest tank in the Aquarium with a viewing area of 14m wide, hundreds of marine animals including small Sharks, Rays, Conger eels, Bass, Cod and Wrasse live as if in their natural environment, hundreds of feet beneath the waves. The tropical tanks of the Coral Seas display over 100 species of brilliantly coloured — often weird and sometime deadly — fish and invertebrates, many of which are rarely seen in UK aquaria.

The finale of the visit is to the Shark Tank where ten Sharks glide in over 700,000 litres of sea water in a massive tank incorporating a special walk-in viewing bubble. This allows visitors the closest encounter possible with the Sharks without joining the Aquarium's divers who swim inside the tank itself.

The National Marine Aquarium, The Fish Quay, Plymouth is open seven days a week from 10am to 6pm and has a Restaurant, Gift Shop and car and coach parking facilities. Ticket prices are £5.99 for an adult, £3.99 for a child, £4.99 for Senior Citizens and £17.99 for a family of four. Annual Membership is available at £25 per person or £55 for a family of four.

For further information please call Judy Ditchburn, JDPR, on 01494 882105 or fax: 01494 881363; or Simon Bradley, Head of Marketing, National Marine Aquarium, on 01752 600301 or fax: 01752 600593.

Watch out for an *A&P* National Marine Aquarium Competition in May!

***PICTURED LEFT** The European Seahorse, Hippocampus Hippocampus.*

***BELOW** The Two Banded Anemonefish.*

***BOTTOM OF PAGE** A Sand Tiger Shark, Eugomphodus taurus.*

Utah Brine Shrimp Decline

Graham Penney, of Yorkshire Brine Shrimp Supplies, has sent a worrying report about the possible effects of a decline in the Brine Shrimp population in Utah's Great Salt Lake. The effect may force prices to rise to £70-£80 per tin minimum for one thing and already his Company has withdrawn stocks from sale to preserve their live biomass production. The report from Utah, dated 23 October 1997, was as follows:

'Utah's Brine Shrimp Population Plummets' was the headline in Jim Wool's report in the *Salt Lake Tribune*.

Brine Shrimp numbers in the Great Salt Lake have plummeted this year, prompting the Utah Division of Wildlife resources to propose an early end to the commercial fishing season.

"The population is down 75 per cent over previous years," said Randy Radant, chief of aquatic resources for the State Agency. The reason, he noted, is probably declining salinity as wet weather sends more fresh water into the salty, land-locked lake.

The fishing season normally would have ended on 31 January, but State experts are planning to call a halt within the next week or two. Because of the reduced population they don't want this year's harvest of the tiny Brine Shrimp eggs to exceed 4.5 million pounds. Last year's harvest was almost 14.7 million pounds, slightly less than the record harvest of slightly more than 14.7 million pounds in the 1995/96 season.

Most Brine Shrimp eggs harvested from the Great Salt Lake are sold to commercial prawn farmers in Southeast Asia who raise the Brine Shrimp as a high-energy food for their prawns.

The Brine Shrimp that hatched this summer apparently did not find enough to eat, said Radant. As a result, fewer shrimp matured to produce the tough eggs that float all winter on the lake's surface. These eggs hatch in the Spring when the lake's water warms up again. Brine Shrimp are an important food for many birds that stop at the Great Salt Lake during their annual migration.

Lack of food for the tiny shrimp is 'probably' related to declining salinity in the lake, said Radant. Less salt alters the mix of microscopic organisms on which the Brine Shrimp feed. There is not enough long-term scientific data to say whether similar salinity fluctuations in the past have caused the same type of changes in the shrimp population. There is no reason to believe that two years of heavy Brine Shrimp harvests are related to this year's drop, he stressed.

Asked if he was alarmed by this year's low numbers, Radant said: "No, not at this time." But he added: "We are taking this action (ending the season early) to make sure we don't have something alarming happen out there."

Our thanks to Graham Penney for this information. Yorkshire Brine Shrimp Supplies can be contacted at: Unit 19, Cape Mills, Coal Hill Lane, Farsley, Leeds, West Yorkshire LS28 5NA. Tel: 0113 255 1228. Fax: 0113 239 3426.

Wright Partnership Turns on the Taps for Hozelock

Hozelock,the multi-national garden equipment company, has appointed the Wright Partnership to cultivate a flourishing UK publicity campaign during 1998.

The Wright Partnership, winner of the 1997 PR Week Award for Best Consumer Campaign for its work on the Tamagotchi, was chosen for its innovative approach to launch Hozelock's revolutionary new Aqua Control Water Timer. Plans are already in the pipeline for both the Chelsea and Hampton Court Flower Shows as part of a campaign that looks set to propagate a blooming future.

Julie Legge, Market Services manager for Hozelock, said: "We are looking for an agency which will combine an energetic and imaginative approach with a proven track record as well as a sprinkling of off-the-wall ideas. Given their recent successes, not least with Tamagotchi, we are convinced that the Wright Partnership is the perfect choice.

Further information from Julie Legge at Hozelock on 01844 294528.

TAP Expands

Technical Aquatic Products Ltd have acquired a purpose built site just 10 miles south of Bristol. Occupying 44,000 square feet this new site will enable the company to manufacture products well into the millennium. The move has created 25 new jobs to work on state-of-the-art filling, labelling and packing production lines. Exhibiting at both Pet Index and GLEE, the company will display many new lines for 1998 and 1999+.

For a free full-colour catalogue contact Katie Squire on 01275 810522 or fax your request on 01275 810577. Technical Aquatic Products Ltd., Blackfriars Road, West End Trading Estate, Nailsea, Bristol BS49 4DJ.

London Aquarium Scoops Best New Attraction Award

The London Aquarium, the capital's only and one of Europe's largest live exhibitions of fish and aquatic life, has scooped the Good Guide to Britain's Best New Attraction of the Year Award.

Recognised as the definitive tourist guide to Britain's top attractions the Aquarium, housed within London's County Hall, was described as 'breathtaking' by the Guide and scored highly for its 'outstanding value for money' according to Editor Allister Aird. Targeting independent travellers the Good Guide to Britain's review is based on the individual's experiences of tourist attractions throughout the UK. The Guide, therefore, remains unbiased compared to some publications, whose findings are purely sourced through their representatives making one visit to the attraction.

The Aquarium also featured in the top ten new UK Internet sites put together by The Yellow Pages for its design innovation and functionality. Accessible under http://www.londonaquarium.co.uk the site receives between 3,500 and 4,000 hits a week. On average users spend eight minutes browsing through areas such as Fish in the Pacific and The Barrier Reef. The site is crammed full of facts about our fascinating aquatic species from around the globe, with additional information on the history and development of County Hall.

For further information please contact: Caroline Randell or Malcolm Sargent, County Hall, Riverside Building, Westminster Bridge Road, London SE1 7PB. Tel: 0171-967 8025. Fax: 0171-967 8029.

MAFF Moves

As from Monday, 24 November 1997 the Ministry of Agriculture, Fisheries and Food (MAFF) Press Office will be based in Nobel House, 17 Smith Square, London SW1P 3JR. The relevant contact numbers in Animal Welfare, Fisheries, Countryside Matters, Flood and Coastal Defence are: Senior Information Officer, John Webb, 0171-238 6001; Information Officer, Mike Dennehy, 0171-238 6054.

On the Other Hand — A World First for Tropical Marine Centre Hatchery!

Earlier this year a pilot project was launched at Tropical Marine Centre's hatchery to explore the feasibility of producing *Lysmata debelius*, or Fire Shrimps, on a commercial basis (see photograph right). The project has proved to be very successful and the hatchery recently became the first centre in the world to successfully breed significant numbers of these shrimps. The next step is to improve and refine the techniques used and apply them to a small-scale production run.

One of the difficulties of breeding *L. debelius* is that they go through many different stages of moulting as various body parts develop, with the shrimps remaining planktonic for anything from nine to 16 weeks. After this time they reach the final metamorphosis stage when they will settle on the bottom and continue to mature into adulthood. Unless monitored very closely they can potentially die during any one of the moults so the process is a long an painstaking business.

The TMC hatchery has developed many ground-breaking techniques since being set up in 1994 under the direction of Mark and Deborah Wilson, with the aim of breeding many species of marine fish, offering a 'tank-raised' alternative to wild-caught species, helping to sustain natural fisheries.

For further information, please contact Jayne Robb at: Tropical Marine Centre, Soleabridge Lane, Chorleywood, Hertfordshire WD3 5SX. Tel: 01923 284151. Fax: 01923 285840.

A Koi Pond For You?

If you'd like to have a Koi pond but several things put you off — like lack of expertise, no confidence or can't face digging the hole — then don't despair: help is at hand in the shape of a new company called, funnily enough, Koi Pond Konstruction Kompany.

Terry Hill (the man behind the parent Terry Hill Design and Build Group of Companies), is not just one of those handy people who can work magic with anything in the construction line. In addition to having more years in the business than he cares to admit to, he is also very well versed in Koi being no less than the Show Chairman of the Middlesex and Surrey Border Section of the British Koi Keepers Society.

His motto (or advice) for would-be Koi keeping customers is "Do It Once, Do It Right — Sit Back and Enjoy". In addition to designing and building original ponds to your wildest dreams, Terry also operates a rectification service for problem ponds and is well versed in the art of fibreglassing techniques. He does admit to having one shortcoming in his otherwise multi-service portfolio — he doesn't supply fish, but he knows a man who does!

So, if you are looking for a new home for your Koi, or simply looking for a sound, constructive start to your Koi keeping hobby, then Terry's your man — you'll probably gain an awful lot of Koi knowledge by the time your new pond is installed just by nattering to the builder, but don't worry, it's all part of the service!

You can contact the Koi Konstruction Kompany at 0181-397 8471, mobile 0850 155088 or by fax on 0181-241 3936.

North East Federation of Aquarist Societies

N.E.F.A.S. wish to inform all fishkeepers of their forthcoming one day Open International Fish Show, on Sunday, 8 March 1998.

The Show will take the normal agenda of an Open Fish Show, complete with an Auction of surplus fish and fish items.

We would like to invite ALL fishkeepers to attend and enjoy a great day out.

Further details from John Chapman on 01325 354815.

KAAS Convention '98

Sponsored by the Federation of British Aquatic Societies the 1998 KAAS Convention will be held on Saturday, 21 March 1998 at its usual venue — Smithy's Hotel, 57 Norfolk Road, Cliftonville, Kent.

Speakers engaged so far for this year's event include Roger Foggitt of Tetra and Dave MacAllister. There will also be an Auction and a Quiz.

The cost for the Convention itself is £10 per person which includes a Buffet. Entry by ticket only, available in advance, from Allan Best, 73 The Fairway, Rochester, Kent ME1 2LT. (Cheques and Postal Orders made payable to 'KAAS', please).

For Friday and/or Saturday overnight accommodation at the hotel please contact them directly on 01843 221980 when mention of the 'KAAS Convention' should secure you B&B facilities at £22.50 per person per night.

SHOW DATES AND FESTIVALS

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

8 March N.E.F.A.S. (N); Greenock A.S. (FS)
21/22 March Yorkshire Aquarist Festival, Doncaster (V)
21 March K.A.A.S. Convention, Smithys Hotel, Cliftonville, Kent
29 March Eastleigh A.S. (FB); Northampton A.S. (FN)
5 April Aberdare A.S. (FB); Robin Hood A.S. (FN)
12 April Oldham A.S. (FN)
19 April Bishop Auckland A.S. (FB); Kirkaldy A.S.; Mentor A.S. (FS)
26 April Stroud A.S.; Swindon A.S. (FB)
10 May Corby A.S. (FB)
17 May CAST 98 (FN); IOW A.S. (Cockleshell) (FB)
24 May Halton A.S. (FN)
30/31 May Fishworld '98, Dunstable (FB)
31 May Caer Urfa A.S. (FB)
6 June S.P.A.S.S. (Chichester) (I)
7 June Derby & D.A. (YAAS); Erith A.S. (FB)
13 June Bracknell A.S. (FN)
14 June Castleford A.S. (V); Teesside A.S. (FN)
28 June St Helens A.S. (FN); York & D.A.S. (V)
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
23 August Glenrothes A.S. (FS); KAAS Show (FB)
30 August T.T.A.A. (Area Group) (FB)
6 September Aston A.S. (YAAS); Cardiff A.S. (FB); Cramlington A.S. (FB)
12 September Hounslow A.S. (FB)
13 September Mid Somerset (BKKS); Sillitoes A.S. (FN)
20 September Mid Sussex A.S. (FB)
27 September Taunton A.S. (FN); Tar Cit; A.S. (USA)
4 October Halifax A.S. (FN); Littlehampton & Bognor A.S. (FB)
11 October Washington A.S. (FB)
18 October Selsey A.S. (FS)
24/25 October British Aquarists Festival, Manchester (FN)
30 October/1 November Supreme Festival of Fishkeeping, Weston-super-Mare (FB)

FNAS North/ South Convention

The FNAS Convention will be held on 26 April 1998 at 10am at the Hereford Road Community Centre, Brinnington, near Stockport.

The first lecture begins at 10.30am with lunch at 12 noon. The 100 Lot Auction begins at 12.30pm with the Convention Programme recommencing at 2.30pm. Tickets are limited and cost £5.

For further details contact Mrs G. Clapham 01422 241 548.

British Cichlid Association Convention

The BCA Convention will be held on Sunday, 29 March 1998

OPEN SHOWS AND MEETINGS

3 March Gloucestershire A.S., 7.30pm, Bell and Cross P.H., St. Oswalds Road, Gloucester. Slide Lecture (subject to be announced). More information from Andy, 01452 372948, or Christine, 01242 520628.
17 March South Park Aquatic Study Society, 8pm, Wimbledon Community Centre, St. Georges Road, Wimbledon SW19. Talk by Ivor Stamp from Reigate & Redhill A.S. Further information from Ken Seaton, 0181-641 2648.
21 March Goldfish Society of Great Britain, 2.30pm, London City Y.M.C.A., Errol Street, London. 'As I See It', by Mr D. H. Smith.
29 March Northampton & D.A.S. Open Show, Northampton Christian School Room, Park Avenue North, Northampton. Details from: D. L. Woodman (Open Show Secretary), 22 Fishers Close, Little Billing, Northampton NN3 9SR.
29 March Clacton Fishkeeping Club Auction of Tropical and Coldwater Fish and Equipment, Great Clacton Community Centre, Valley Road, Great Clacton, Essex. Raffle, Buffet, Sales Table, etc. For more information please Mick Millar on 01255 428065.
29 March Washington Aquarist Society & Pondkeepers. Auction of Fish and Equipment, Nissan Sports and Leisure Facility, Nissan Car Works, Washington, Tyne and Wear. Booking of Lots 10.30am. Auction starts at 12.30pm prompt. Raffle, Bar and Refreshments Available. Any Lots unsold before 6pm will be returned to the vendor. For further information contact Alan Rice, 0191 417 0768.
19 April Kirkaldy A.S. Open Show and Auction, Balwearie High School, Kirkaldy. Information from: Mike Dewar, 01592 757089.

at The Deepings School, Deeping St James, near Peterborough. Doors open 10.30 am and admission will be £2.50 to members, £3.50 to non-members, with supervised children under 14 free.

Guest speakers include Rainer Stawikowski, 'South American Cichlids'; An Auction of (mainly) Cichlids, Other Fish and Equipment; refreshments will also be available.

Further details from: BCA Publicity on 0161 643 2764.

Yorkshire Aquarist Festival

It's not too late to consider supporting and visiting this year's YAF — if any Societies haven't applied for their free Information Pack then ring Marie Harrop on 01484 666591 without delay.

This year's event will be even more livestock packed than before as, in addition to the hundreds of fish and aquarium related equipment on display, there will be the Artis Pet Sanctuary of Doncaster bringing along their furry rescue animals for children to have a 'hands-on' experience (don't forget the Ferret Racing Track!). The British Houserabbit Association will show off their housetrained bunnies and there will be Specialist Societies with Amphibians, Snakes, Spiders and reptiles, too.

The Festival is open to the Public on Saturday and Sunday, 21/22 March at the Doncaster Racecourse and further information can be obtained from Marie Harrop at the previously quoted telephone number.

Grocklemania '98

Early notice is given for this year's extravaganza on the Isle of Wight which takes place over the weekend of 15/17 May at Harcourt Sands Holiday Camp, near Ryde. Tickets cost £65 per adult and £39 for juniors, with the under twos going free. These prices include free ferry crossing for a car containing four (the under twos don't count!); a £20 surcharge is levied for cars containing fewer than four. All meals are included from Friday evening to Sunday breakfast.

Apart from the excitement of the Open Show on the Sunday (17) there will be the usual hectic activities as Societies compete for the Thomas Crapper Trophy.

Tickets may be obtained, together with full details of Grocklemania '98, from Les Pearce, 44 Weeks Road, Ryde, Isle of Wight PO33 2TL. Tel: 01983 613575.

Greenock Open Show

Greenock & District Aquarist Society is holding its 13th Annual Open Show on Sunday, 8 March at Boglestone Community Centre, Dubbs Road, Port Glasgow. The Show will consist of 63 species of fish with 32 Special Awards, also contained in the Schedule will be Best in Show, Best Coldwater Fish and Best Junior Award. Booking in of fish starts at 10am, closing at 1pm. Judging from 1pm to 4.30pm. There will be Refreshments, Fish Auction, Tombola and Raffle. All clubs and members of the public are welcome to take part.

Further details from Jim Sheekey, 01475 704219.

Calling All Juniors!

With the pond season not too far off the FBAS, in association with *A&P*, is pleased to announce the Laguna Junior Fishkeepers Pond Design Competition, an exciting new competition sponsored by Laguna as part of the Federation's 60th Anniversary year.

Junior fishkeepers (between eight and 16 years of age), are invited to submit designs for a Garden Pond which will not only be suitable for fish but also attract other aquatic or insect life. The two best designs (subject to practicability, nothing too complex, please!) will be featured on the FBAS display at this year's Hampton Court Palace Flower Show to be held in July.

The complete pond ▶

◀ together with its surrounding plants, marginals and/or bog garden must fit within an area of 16 metres by four metres. Provision should be made for pump, filtration, etc, in the design. Please send your designs (plan and side elevation sketches with dimensions, planting layout, etc) to: Junior Pond Designs, c/o Peter Furze, 9 Upton Road, Hounslow, Middlesex TW3 3HP.

Another exciting opportunity for Juniors everywhere is the Tetra Aqua Quiz to be held during 1998 and culminating in the final at this year's Supreme Festival of Fishkeeping. Jointly organised by the FBAS and the Tetra Club, eliminating heats will be conducted through the year and again the competition is open to all junior fishkeepers up to the age of 16.

Watch this space for more progress information each month!

SOCIETY WORLD

Clacton Auction

Clacton Fishkeeping Club will be hold an Auction of Tropical and Coldwater Fish and Equipment on Sunday, 29 March 1998.

Also scheduled will be a Raffle, Buffet and Sales Table.

For more information phone Mick Millar on 01255 428065.

Other countrywide Auctions are:
1 March CAST 88;
15 March Merseyside A.S.;
29 March Halifax A.S.;
WASP; 19 April Preston & D.A.S.; 3 May Ryedale A.S.; 28 June York A.S.;
12 July WASP;
26 July Oasis F.C., 13 September Silktown A.S.;
11 October WASP;
15 November FNAS;
22 November Oasis F.C.

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