

AQUARIST & PONDKEEPER

JANUARY 1997

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The Better Fishkeeping Magazine

INSIDE

*Focus on South
America*

*Supreme
Festival of
Fishkeeping
Report*

*Tetra
Competition*



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In many people's eyes cichlids are big, ugly fish which wreck the aquarium come breeding time. Fortunately, this is not always true and the Sheephead Acara, *Laetacara curviceps*, is a modest-sized, peaceful fish from South America which seems only too happy to pose for our cover.

Photo: M.P. & C. PIEDNOIR

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Comment

Well, I have only one question to ask — where did the last 12 months go to?

It seems like only yesterday (oh, alright then, last week) that A&P 'under new management' was facing its first New Year. Thanks to support from contributors, trade and readers alike A&P has continued to offer genuine, alternative aquatic reading on the shelves of your local retailer.

There have been changes too — at least the confusing (to some) 'The New' flash on the cover has disappeared and, for 1997, there are other significant changes in the pipeline, too. For several reasons we have decided to reduce the number of Supplements to a more manageable four times a year. These will reflect the four aspects of the hobby (Tropical, Coldwater, Kai and Marine) and appear at suitably-appropriate times of the year, not necessarily quarterly.

One result will be to free-up more pages of the magazines for other articles and features, and so readers should be getting a good overall mix of all aspects of the hobby every month and not be crowded out by the 'flavour of the month'.

New, too, for 1997, each issue will have a focus or theme: for instance, this month we will be concentrating on South American fishes and Plants.

During 1996 our mailing did, at times, contain some controversial subject matter; for this, we have been both congratulated and also castigated — depending where you're coming from. The judgement on what to include and what to discourage is a delicate matter and one that has to be made on the merits (or not) of each case at every instance; there is a very fine line between healthy criticism and what can only be described as industrial conflict.

It is not the intention of this magazine to provide a warring ground between aggrieved parties. Similarly, every article represents the views of its author and is not endorsed in any way by A&P but the offer of a right to reply is always offered, providing that the reply stays within the bounds of courtesy and fair-mindedness.

It is true that to some 'controversial' copy softens their reading but in the wider aspect readers (especially those new to our pages) continually being faced with antagonistic viewpoints may begin to wonder whether a supposedly-peaceful hobby — as fishkeeping is always held up to be — is really worth getting into if it leads to such unrest.

And so to 1997 and whatever it may hold in store for all of us. Already you will find news within these pages of a new Kai event and with our regular team with their 'ears to the tank or pond' we should have plenty to interest you in the next 12 months.

John Mills

EDITOR

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APISTOGRAMMA



Perfection in Miniature

Apistogramma cacatuoides (female)

I began keeping fish for the first time during 1993. My interest in *Apistogramma* species began quite early into the hobby when I purchased a pair of *Apistogramma cacatuoides*. I had read quite a few aquatic books about dwarf cichlids but obtaining them was another matter — I had to order mine as they were nowhere to be seen! Fortunately, nowadays, the situation has changed for the better and many more species are available to the hobbyist if you shop around.

To me my little dwarfs were the most beautiful and fascinating fish I had seen and they settled in nicely to

their new home. I spent many anxious moments waiting for them to spawn. When this happened my love and obsession with cichlids began. *Apistogramma* is an ideal community cichlid, either housed in a 'species' tank or 'community' tank they will

prosper well, given proper conditions.

INTRODUCTION

Apistogramma is the largest genus of dwarf cichlids. It currently includes 90 identified species and many more which are yet to be

HELEN BURNS SINGS THE PRAISES OF THIS COLOURFUL GENUS

PHOTOGRAPHS BY THE AUTHOR

scientifically identified. With a maximum length of 10cm although some cases up to 12cm they are truly dwarf cichlids. In the wild they do not exceed these lengths but in the home aquarium they can grow larger.

DISTRIBUTION

Apistogramma are found in small streams and pools in the South American rain forest and savannah. The majority of species come from the Amazon basin including the drainage areas of its tributaries. They are found in black, white and clear water where the temperature can rise above 30°C during the dry season.

Favourite places are near the banks in very shallow water, a depth of just a few centimetres. Water chemistry varies from very soft and acidic to slightly hard and alkaline.

WATER CHEMISTRY

Aptotogramma require an acidic pH, in some cases as low as pH5. One thing they all have in common is the need for soft water (Hardness) 0-10 GH being ideal, 14GH being the maximum. I am very fortunate where I live in Scotland in that the tap water is neutral (pH7) and the water is extremely soft (GH.02) which is ideal for my *Aptotogramma* species.

Unfortunately this is not the case throughout the country, therefore adjustments may have to be made by you the aquarist to rectify this.

The cheapest method of reducing the pH and Hardness is by collecting rainwater which should be filtered through carbon for a couple of days to remove the 'nasties', then by filtering this again through peat. This method also reduces the Carbonate Hardness (KH) in the water. When KH is present it can cause a viable spawn to be infertile. The KH enters the egg after the male has fertilised the spawning and kills the sperm.

TANK MAINTENANCE

I have found that weekly water changes of 20-25 per cent will ensure a healthy environment. Remember to gravel clean the tank during water changes. When the filter sponges require cleaning do not use tap water (this kills the vital bacteria); rinse the sponge(s)

in aquarium water outside of the tank. It is advisable to do this between water changes. A slight drop in temperature (2-3°) during water changes can induce spawning activity. Having a low pH combined with soft water yield low bacteria counts, this means that your tank cannot absorb a lot of waste before the water fouls.

Your fishes' success or failure depends on your maintenance.

SETTING UP YOUR TANK

The height of the tank is unimportant, it is the floor area which should take precedence, the wider the tank the better.

Dwarf cichlids spend most of their time on the floor of the tank. A tank measuring 18in long x 10in wide x 10in high would be the minimum tank size to house one pair of dwarfs. To house one male and two females 24x12x12in would be a good choice. Note that a larger tank is actually more flexible to maintain good water quality.

Take care when choosing the substrate as *Aptotogramma* have tiny mouths and

excavate to a small degree when breeding; therefore the substrate has to be small. I use a mixture of pea gravel and sand to a depth of 1/2-1in which seems to suit them. The fish are cave spawners and very secretive so this must be taken into account when selecting suitable materials for the decor in the tank. Small clay pots and/or coconut shells halved are ideal spawning sites.

One last item which I strongly recommend is plants. Floating plants provide a sense of security. Java Moss, Java Fern and *Anubias nana* partially covering the floor of the tank are an ideal choice. *Aptos*, unlike their larger cousins, do not disturb plants.

Lighting should be subdued.

Temperature. A good average is 26°C (79°F) but can vary depending on species.

FILTRATION

I cannot express enough how important a good filtration system is. Avoid excess water turbulence, remember these little fish come from pools and small

streams. I never use undergravel filtration as this can trap fry. I use air driven sponge filters which are inexpensive and you can easily control the flow rate. They also have the added advantage of being colonised with Rotifers that any fry can feed on.

FOODS

Keeping dwarf cichlids causes no particular demands on special foods. I feed my species three times daily — first feed good quality flake; second feed is either one of the following, frozen Bloodworm, frozen Brine Shrimp or Beef-heart mix; third feed is either Whiteworms or Tetra 'Prima'.

A good varied diet combined with proper maintenance are the two most important factors in fish keeping.

BREEDING BEHAVIOUR AND PARENTAL CARE

The fascination for me with cichlids is the parental care of their young. If you have never witnessed this



Aptotogramma caudocaudatum (male).



I have compiled the following table containing various *Apistogramma* species you may come across to help you with the daily maintenance and the adjustments in water chemistry which may be required for their breeding success.

Species	Pair	Harem	pH	gH	Temp	Breeding pH	gH	Temp
<i>A. borelli</i>	Yes	Yes	7.0-7.3	8-12	26°C	Same	Same	Same
<i>A. cacatooides</i>	Yes	Yes	7.0-7.5	8-12	26°C	Same	Same	Same
<i>A. macmasteri</i>	Yes		6.0-6.5	0-04	27°C	Same	Same	Same
<i>A. linkoi</i>	Yes	Yes	7.0-6.5	8-12	26°C	Same	Same	Same
<i>A. apasizi</i>		Yes	6.0-6.5	4-08	27°C	5.0-5.5	0-04	28°C
<i>A. binoculata</i>		Yes	6.5-6.5	4-08	27°C	Same	Same	Same
<i>A. gephyra</i>	Yes	Yes	6.0-6.5	4-08	26°C	5.0-5.5	0-04	26°C
<i>A. gibbiceps</i>	Yes	Yes	6.0-6.5	4-08	28°C	5.5-4.4	0-04	28°C
<i>A. longfisi</i>	Yes		6.5-6.5	4-08	26°C	Same	Same	Same
<i>A. imitator</i>	Yes		5.5-6.0	0-04	27°C	4.5-5.5	0-02	30°C
<i>A. nijsseni</i>		Yes	6.0-6.5	0-04	27°C	5.0-5.5	0-04	27°C
<i>A. petenense</i>	Yes		5.5-5.5	0-04	28°C	5.0-5.5	0.04	28°C
<i>A. infasciata</i>		Yes	6.0-6.5	0-04	27°C	Same	Same	Same
<i>A. nigita</i>	Yes	Yes	6.0-6.5	4-08	26°C	Same	Same	Same

you will be in for a delightful surprise which will never cease to amaze you.

When *Apistogrammas* start to defend a territory you can be sure spawning is imminent. Their colouration is now intense. The female changes to a vivid yellow and the black markings on her body make her an outstanding little fish. Of course, all the various species have different markings but basically females are yellow and black at this time.

The territory depends on the layout of the tank. If the aquarium has been arranged with a profusion of pots, stones, bogwood and plants they are content with a smallish area. If, on the other hand, the whole width of the tank can be clearly surveyed then territories of enormous size are established. You will observe a lot of activity in the area of their chosen site (usually inside a pot) with the female either defending the area on her own or with the help from her partner

(this varies with species).

Depending on the temperature in the tank the eggs usually hatch in 48 hours and then approximately five days later these 'wrigglers' become free swimming and the female will escort her little family foraging for food. At this stage you will have to feed the fry with newly-hatched Brine Shrimp. Take care to wash it well to remove all the salt. I use a small syringe and carefully squirt the Brine Shrimp as near as possible to the fry. All being well, ten minutes later you can observe that the fry now have swollen orange stomachs. Seeing this is good news — as you know that the fry are eating!

I alternate feedings with a Microworm culture. Feed the young little and as often as possible, four to five times a day. If you have an established tank there are plenty of nice things for them to browse on and this is the advantage of having sponge filtration as they can be seen eating from the sponge: to them it is like a

large lollipop!

It is amazing just how quickly the fry can grow, and a week later you can actually see the fry without having your nose stuck on the front of the tank!

When the fry are two to three weeks old they can be seen foraging for food on their own. At this stage you can now introduce finely crushed flake for them to eat and gradually reduce the feeding of Brine Shrimp. It is now up to you as to when you remove the fry to a separate rearing tank. By now the parents may be thinking of going through the whole procedure again!

As you will see many of the species can be housed as a pair, therefore the smaller sized aquarium would suffice. If, on the other hand, you choose to have one male to several females (harems) a much larger aquarium must be used.

I once had a tank which housed two male and 10 female *Apistogramma borelli*. On one occasion I witnessed that two of the females had spawned on the same pot.

One had spawned in the inside of pot and the other had spawned on the outside of same pot. Both managed to successfully rear their wee families.

If I was asked what would be a good *Apistogramma* species for the beginner I would strongly recommend having one pair of *A. macmasteri*. I have found them to be very tolerant with regards to fluctuations in water chemistry. The big plus for them is that they are wonderful parents, working as a team and rewarding you with many broods of young, all growing up in the same tank with their parents. What more could you ask for in a family; some humans could learn a thing or two!

If you require any information on *Apistogramma* species or in fact any cichlid species I would strongly recommend joining The British Cichlid Association. You can drop them a line, enclosing an SAE, at the following address: Ken Hilton, Membership Secretary, 248 Longridge, Knutsford, Cheshire, WA16 8PH.

WINTER RESOLUTIONS

DAVID TWIGG PONDERES ON ASPECTS OF THE KOI POND NOW AND IN THE FUTURE

PHOTOGRAPHS BY THE AUTHOR

Pond design is one of the things that Koi keepers everywhere consider at this time of the year and here in the Heart of England is no exception.

One of my friends has a pond in a large, well wooded garden and consequently his pond suffers from falling leaves. The pond is 'in-ground' so that even those leaves that fall on the opposite side of the garden tend to tumble their way across the lawn to join those dropped locally and be deposited in the pond.

Although his design incorporates a separate pump pulling two very efficient surface skimmers the pond still suffers from floating leaves. Why?

The volume of leaves falling at any time can exceed the holding capacity of the skimmer baskets and once almost

blocked little skimming action takes place. Constant vigilance has to be the order of the day to prevent this situation turning into a possible pump starvation situation with attendant disastrous consequences. This has meant emptying the skimmer baskets several times each day; something that was not envisaged at time of design. We decided that it was necessary to investigate the possibility of fitting a larger basket that would allow the skimmer to run for longer before requiring emptying. I understand basket replacement is well underway and look forward to seeing the end result!

Since becoming aware of this problem I have spoken to several people only to find they, too, have a similar dilemma and one of those people told me that there is a manufacturer out there somewhere who is

making skimmers with oversize baskets for initial fit when building ponds; as yet I have no name but I am sure the Koi network will be buzzing through to me shortly. Although I, too, live in a heavily tree populated area I do not suffer to the same degree with skimmer blockage. Why?

My pond is built 'out of ground' and consequently those leaves that blow in along the ground just pile up against the wall rather than being blown into the water. The only leaves that hit the surface and consequently end up in the skimmer basket are those that fall directly into the pond. A wonderful non-intentional design feature, I guess. So, whilst dreaming idly away with thoughts of a new pond please give consideration to not only the requirement of the Koi but that of the trees

as well.

Quarantine is becoming an ever more important part of Koi keeping. As time in the hobby passes so our Koi collections improve in quality and grow on in size. It would be tragic, therefore, to introduce a new fish that carried with it some form of disease that could be passed to the collection with possibly fatal results. Even if fatalities did not occur in such a situation, a lot of time will have been spent bringing the stock back to health and the trauma experienced by both Koi and keeper would probably be quite severe.

So, another thought for those long winter evenings is that of providing some form of quarantine set-up that can also double as a treatment centre should that unfortunate need arise. Design criteria to be considered here are size, related to size of



addition of a heater or just simply a resolution to do your best to improve the lot

of the pets in your care? Whatever the outcome I wish you and your Koi long health and happiness for 1997 and long into the future.

Koi to be housed, and all other parameters as per any other pond design, eg. shape, depth, filtration, and so on.

What then will be the result of your deliberations over the next few weeks? A new pond or quarantine system, an upgrade of some sort such as improvement of skimming system,

These two ponds suffer differently from autumn leaf drop.



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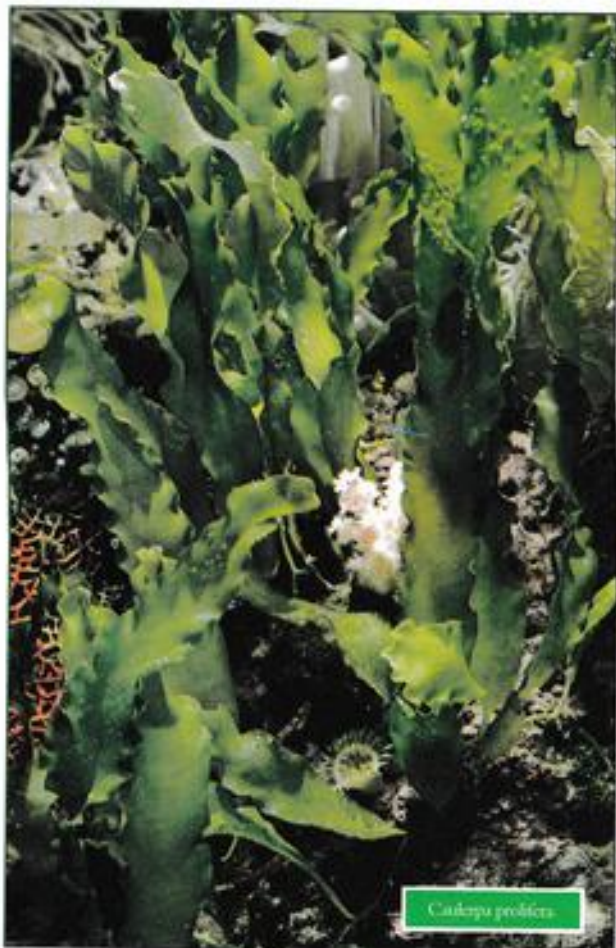
NICK DAKIN WELCOMES THE 'GREEN PARTY'

PHOTOGRAPHS BY THE AUTHOR

Mention the word 'algae' to any tropical

freshwater aquarist or pondkeeper and you'll immediately bring on two guaranteed responses; the first will be a loud groan (sometimes accompanied by a distinct twitch!) and the second, a swift hand-swing towards a bottle of proprietary herbicide! For algae, you see, is the bane of their lives and they can spend many a frustrating hour trying to get rid of it. On the other hand, mention the same word to a marine aquarist and it is very likely to elicit a very different and much more favourable reaction.

As marine aquarists we thought we already had it all: colourful and exotic fishes as well as an



endlessly fascinating form of invertebrates, yet there is still another facet of life that can bring even further interest to our aquaria ... plants, and, in particular, algae. In many cases it is quite common for mariners to actually deliberately introduce, actively encourage and carefully nurture particularly decorative species!

WHAT IS ALGAE?

Alga is a plant that does not flower and is nearly always found in association with water. No more, no less. It is as ancient as life on Earth and there are a few unifying (but not exclusive) factors. Unlike its terrestrial cousins it does not possess a cellulose-based structure that enables it to remain rigid out of water and most species flop about



LEFT

Udotea sp. spinulosa.

BELOW

Caulerpa verticillatoides (HOWE).

aimlessly when removed from the supporting medium.

However, a few marine species utilise bicarbonates to give them a firm structure, in or out of water.

MICRO v MACRO

Recently much has been made of the terms 'micro' and 'macro' in relation to algae. All too often micro algae was seen to be exclusively encompassing all forms that cause a nuisance in the aquaria, whilst macro algae was wholly decorative. This is not altogether true and an accurate explanation of the two terms is always useful.

'Micro' applies to single-cell or groups of cells joined together. Their existence may be encountered as drifting phytoplankton or substrate occupiers and include the nuisance forms of 'slime' algae as well as the welcome rock encrusting calcareous forms.

'Macro' always refers to the larger species and can easily be recognisable as plants. These are generally the ones that attract the marine aquarist. But, as we shall see, not all macro algae are well-behaved and their invasiveness can sometimes

earn them the title of nuisance algae as well.

THE CORRECT TERMINOLOGY

Unlike terrestrial plants, algae have a terminology all of their own. What most people see as 'leaves' are in fact blades. The 'runners' that connect the blades are more correctly termed stipes and what many would call 'roots' are holdfasts. These distinctions are reasonably

important, although it would be true to say that nearly all aquarists prefer to use the erroneous 'garden plants' terms!

For example, the holdfast does not perform all the same functions of a root. It is there merely to prevent the plant from being swept away. Nutrients do not pass from this feature into the main body of the algae, nor does it help to keep the structure erect. As an added note of interest there is a singular term — alga, and a

plural term — algae; both expert and novice are often seen to ignore this distinction, regarding everything universally as 'algae'.

REPRODUCTION

Being unable to flower seeds are out of the question, but spores are not and these are commonly produced on the blades for distribution in the current (much in the same way as fungi spread their spores in the wind). Stipes generate the size of individual plants and, if left unchecked, can often form massive clumps. Pieces that break from these clumps are carried away by the current and settle to create new plants in a different location.

PHOTOSYNTHESIS

In common with nearly all plants algae photosynthesise, utilising the



MARINE Algae Enhancement

energy of light to combine carbon dioxide and water in the production of useful nutrients with oxygen as a by-product. As a generality the

adaptability of this cycle is reflected in the colour of the algae in question. Green

varieties are found in shallow water, whereas deeper waters encourage red and brown pigments to take full advantage of the limited light available. Algae are also capable of

assimilating other nutrients from the surrounding water through their tissues. Nitrates, nitrites, ammonia, phosphates, silicates and iron have all been noted and this ability can sometimes be adapted to filter various



ABOVE *Halymenia* sp.

BELOW *Caulerpa racemosa*.

unwanted substances from the water in the form of 'algae scrubbers'. Mainly used in public aquaria in the

United States algae scrubbers consist of a large flat bed on which certain species of algae are nurtured.



Aquarium water is passed over the algae in a continuous stream. The theory is that the algae extracts unwanted substances

as nutrients and in doing so purifies the water. In practice, the reality has been somewhat variable in success, algal cultures have crashed for no apparent reason, require constant maintenance/monitoring and the efficiency of scrubbers have proved to vary wildly from system to system. Nevertheless, they do indicate the

usefulness of the plant in the aquarium, other than for decorative purposes.

At night the absence of light makes photosynthesis impossible and the generation of useful by-products such as oxygen is curtailed; in common with other plants carbon dioxide is released during the hours of darkness and this can cause a problem in the well-stocked aquarium. Extra carbon dioxide and a lack of dissolved oxygen when the lights go off can put unwanted stress on fish and some invertebrates. Therefore, if lush growths of algae are maintained, increased water circulation must be provided.

HARVESTING ALGAE

Some species of algae can establish themselves very quickly and if left unchecked would overtake any display. Algae harvesting performs two useful

MARINE Algae Enhancement

functions: (1) it removes and thins out unwanted growth, and (2) all the potentially harmful substances locked up in their tissues are discarded.

Rampant species grow back without any delay and the new growths can begin the cycle all over again. When harvesting always remove the older growths, leaving the younger and more vigorous shoots in situ. In this way regeneration will be quick and less prone to die-back.

DIE-BACK

The term 'die-back' refers to an alarming and potentially dangerous condition whereby the whole crop of algae goes white and dies — as rapidly as overnight! In addition, the water may turn milky-white and cause distress among fish and invertebrates as bound-up toxins are suddenly released back into the water. The reasons for die-back are not always clear but the major cause appears to be deteriorating water quality triggering a 'destructive mode' somewhere in the plant mechanism. At other times it appears that the particular plant has just got too old and is unable to survive. This can largely be avoided by regular harvesting of older growths as outlined previously. If this condition is experienced remove all growth except for the holdfasts as these may

generate new plants when water conditions are improved.

LIGHTING

Most green algae require moderate to bright lighting, while red and brown species will thrive in low to medium light levels. Illumination may be supplied by metal halides, mercury vapour or fluorescent tubes as the source does not appear to be crucial in many instances. Generally speaking, green algae will grow much more slowly where lighting is dim, even if water conditions are optimum. The opposite is not true, however, of red and brown species; they remain slow growers even under intense lighting.

WATER CONDITIONS

The following parameters suit most decorative algae species:

Ammonia — zero; Nitrite — zero; Nitrates and phosphates — adjusted to suit livestock and not deliberately elevated for algal

growth; SG — stable between 1.019-1.026; Temperature — 77°F (25°C) as an optimum, although any stable level between 73-85°F (23-29°C) would suit; Calcium — 350-400ppm is important for calcareous species; Water changes — best maintained at 15-25 per cent every two weeks.

Like most marine livestock the key to success is stability; algae dislike constantly changing conditions.

THE ALGAE SHOWTANK

It is quite possible to set up an aquarium featuring algae exclusively. There are well over 20 different species available to the hobbyist and the effect can be stunning. The algae showtank can be run on much the same lines as the Dutch freshwater plant-only aquarium and makes an unusual display.

A DECORATIVE NUISANCE?

Even decorative algae can become a nuisance if allowed to grow rampantly amongst corals. Green species spreading by stipes need to be constantly monitored and pruned back if they become invasive. Once holdfasts become embedded in polyp colonies they can be particularly difficult to eradicate and will eventually destroy such colonies as the algae smother it. Pruning is easily achieved by the dextrous use of the forefinger and thumb, carefully easing out the invading algae and clipping

it back to acceptable bounds.

POPULAR ALGAE SPECIES

(1) *Caulerpa verticillarioides* (HOWE) was once known as *C. mexicana* and is still probably the most common green algae kept by the marine aquarist. It grows very quickly and can be quite invasive if not 'pruned' regularly.

(2) *Caulerpa prolifera* is another common green algae found in marine aquaria. As the name suggests under the right conditions growth can be positively rampant!

(3) *Caulerpa racemosa* is sometimes called Grape Algae for obvious reasons. While quite decorative it must not be allowed to spread among coral polyps as it can be extremely difficult to remove.

(4) *Caulerpa cymosa* is also known as the Cactus Algae owing to its cactus-like blades. It is not a rampant species and is easily kept within bounds.

(5) *Halimeda opuntia* is a calcareous algae that grows in clumps. Unfortunately, part of its life cycle demands that whole clumps go white and die without warning.

(6) *Ulotea spinulosa* is another calcareous algae that resembles a fan. It is very decorative but sensitive to less than optimum water conditions.

(7) *Halymenia* spp. and *Graclaria* spp. are red algae, much prized by algae enthusiasts. They grow relatively slowly compared to *Caulerpa* spp. but are very decorative and not difficult to acquire.

(8) Pink encrusting algae is coralline in nature and will cover almost any hard surface such as rocks, glass, piping, etc. It is much beloved of reef keepers and they encourage it by maintaining a high level of calcium in the water, usually by means of a calcium reactor.

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A GLIMPSE OF PANDORA'S BOX

ALEX STEPHENSON PONDERES OVER FISH HEALTH TREATMENT IN THE FUTURE

DRAWINGS BY THE AUTHOR

I want to make it quite clear at the outset that my only qualification for writing about fish diseases is that, over the years, my fish have had a few.

The fish I keep have complete faith in me. They are under the impression that I know all about their requirements; they think I am an expert in things like water chemistry, foods and feeding, diseases and intensive care whenever the need arises. I haven't the heart to tell them the truth. The really sad fact is I am not alone in this respect.

Have you lost a fish lately? What did it die of? The chances are you have no idea. I expect you've read one or more books on fish health and diseases and have ruled out most of the suggested causes. Well, things don't just die for the fun of it, so we must be

overlooking something. Personally, I think we are overlooking a lot of things: perhaps it had a brain haemorrhage or maybe a heart attack. There is no reason to suppose that fish are less susceptible to mechanical failure than ourselves. Could it have been old age?

The practice of keeping certain species at a higher

temperature than is natural for them certainly ages them prematurely. If your unfortunate fish croaked through no fault of its own (and no fault of yours), then it is possible it died of some disease. There may be several reasons why you didn't diagnose the problem; unless the fish had one of the well-known complaints which produce readily-

recognisable symptoms you will have had little chance, if any, of preventing its demise. Don't feel too bad about it — there are numerous common fish complaints which can only be identified by very experienced people who have the necessary equipment for the work. There are many more

diseases which defy even the experts and remain unidentified. All of which leads one to wonder how many more there are as yet undiscovered?

A pull-out feature 'Common Fish Diseases' (from an old *A&P*, February 1993, I believe) told me a number of things I didn't know. There is no doubt about it, if it's knowledge you're after you have to consult the oracles. Having said that, I am sure the oracles would agree that our understanding of fish health and disease is still far from complete. To



"If I'm not mistaken — we need a kidney donor!"

get some idea of the formidable task confronting scientists in this field, try this exercise:

Start making a list of all the diseases which can affect humans. When you have covered everything from Boils to Beri-beri and have exhausted your knowledge, talk to someone from the medical profession. Your list, if you haven't already given up, will now be massive. Now add to these volumes the names of diseases which affect other land-dwelling species of domestic animals, farm animals and the vast array of wild animals (any good vet can expand your lists to cover such things as Laminitis and Rinderpest).

I don't seriously expect anyone to have made up such lists, but it is enough to imagine just how long they might well turn out to be. Now I would like you to consider, if so many diseases exist amongst land-dwelling creatures isn't it reasonable to suppose a comparable number of diseases exists amongst water-dwelling creatures?

In other words, the list of fish disorders could be just as long!

Although our knowledge of fish health will continue to improve it is never likely to match the research work into human diseases, which is why my GP knows even less about fish diseases than I do. Of course, even if the experts were to achieve a complete knowledge of fish welfare this would not make me a 'Guppy Gynaecologist' or a 'Bleeding-Heart Specialist' — I feel there will always be points beyond which the layman should not go. This, in effect, means that eventually there will need to be professional



"He's turned over — quick, get him into crash!"

help available for fish.

There are veterinary surgeons who are sufficiently interested to be very helpful but these are few and far between. Besides, the scope of competence we expect from our local vets is already huge, expecting life support for everything from Bullocks to Budgerigars, and to add the vast world of fishes to their repertoire is totally unrealistic.

In practice, the cost of professional services would always have to be balanced against the value, or replacement cost, of the fish concerned. So, expert assistance may only be sought if many fish were involved. This will always be the case as long as fish are cheap and considered expendable. A state of affairs which could, and in my opinion should, eventually change. My views on the topic are known well enough, so we've no need to dwell on them here.

Effective disease control can only be made possible by early and correct diagnosis. If the problem is

should be well within the capabilities of the average hobbyist: after all, fish get flukes a bit like dogs get fleas — and they are dealt with in much the same way! Some other problems, however, are not so obvious and wrong diagnosis (with consequent wrong treatment) is probably the cause of many needless deaths.

My vision of the future could be totally wrong — we might never get a 'Flying Fish Doctor Service'. Amateur health care, supported by the 'oracles' (have you ever wondered who they have to ask?) Through books and magazine articles may always be the norm.

something easy to determine like a few flukes, treatment

Meanwhile, please don't tell my fish.

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Piranhas Galore in Surrey!

The Piranha display at Underwater World consists of six Red-bellied Piranha (*Serrasalmo nattereri*) each measuring around 7in in length. These fish were purchased from Neil Hardy Aquatics as 1/4in specimens in 1995.

The tank used to house the fish is 8ft long, 5ft high and 8ft deep. This is part of a larger recirculating system with a total capacity of 4,500 gallons. The water conditions in this system are soft and acidic with 80 per cent rainwater and 20 per cent tapwater being used for large-scale monthly water changes; pH is maintained at 6.6 by use of CO₂. A transparent roof with supplementary lighting — for those long winter nights — gives us a seasonal photo-period and some degree of temperature variation.

The Piranha first began to show reproductive behaviour at an age of 18 months — in the lusty month of May, when the three males started clearing nests on the floor of the aquarium, biting the leaves of the Giant Vallis down to ground level and digging shallow depressions 30cm (1ft) across. At this time the other inhabitants of the display (Neons and Glowlights) were chased away from the nest site and the females swimming above were courted passionately. This behaviour continued from May onwards with young fish of about 1in — presumably from the first spawnings — swimming in shoals at the front of the tank in early July. It remains to be seen how the parents will react to their young once they reach larger sizes, but for now they are being ignored unless they stray too close to the nest-guarding males.

Information supplied by: Paul Tapley (Head Aquarist), Underwater World, Birdworld, Holt Pound, nr Farnham, Surrey GU10 4LD. Tel: 01420 22140. Fax: 01420 23715.

Following the enormous success of their first course last November, Berkshire College of Agriculture will be repeating a second series of evening classes on aquarium and pond fish, entitled 'Keeping Fish'. The classes comprise talks, slide shows and practical sessions, and cater for all levels of experience from complete novices to the more advanced fishkeeper. They are equally suitable for pet shop retailers who wish to expand into the aquatics field. The classes take place over five consecutive Thursday evenings, between 7pm and 9.30pm, commencing 20 February 1997.

The College will also be hosting a full day course entitled 'Pet Fish from Goldfish to Piranhas' which is primarily aimed at the novice and would-be fishkeeper. This will take place on Saturday, 22 February 1997 and will include lectures and slide shows.

The fishkeeping courses are run by Dr. P. Burgess and are informal, with plenty of opportunity for questions. A College Certificate of Attendance will be awarded for each course.

For further details, please contact the Short Course Admissions Office at The Berkshire College of Agriculture, Hall Place, Burchetts Green, Maidenhead, Berkshire SL6 6QR. Tel: 01628-824444. Fax: 01628824695.



Major new Koi Show for 1997

The UK professional dealers have announced a ground breaking international Koi Show for 1997. The Show is called UKoi '97 and is the most exciting development in Koi Shows for a generation. UKoi '97 will be held on 31 May and 1 June 1997 at Haydock Park Racecourse in Cheshire which is located at junction 23 of the M6.

UKoi '97 is not a one-off Show, instead it aims to offer Koi enthusiasts at all levels an annual institution of enduring and uncompromising quality and

aims to provide Koi Keepers with the ultimate Nishikigoi Show experience.

The basic philosophy behind UKoi '97 is to proudly demonstrate just how a Koi Show should be staged, and the Show has three primary objectives:

- (1) To provide a safe Koi Show where exhibited Koi are the unequivocal priority.
- (2) To provide a Show of genuinely international standing that offers meaningful and real competition.
- (3) To provide an appropriate annual platform for the UK Koi industry and hobby to display and celebrate its success.

In order to achieve these objectives significant investment has been required and one of the main innovations UKoi '97 has designed is a totally new approach to exhibiting Koi. Conventionally Koi have been shown in collapsible Show Vats. As everyone knows, however diligent Show Managers are in their efforts to maintain water quality, it is always a losing battle to try and maintain acceptable water quality in conventional Show Vats simply by changing water. In view of this, UKoi has taken a completely new look at this challenge and adopted a totally new approach to solving this perennial problem.

UKoi have designed and constructed purpose-built Show

Lagoons which have been developed specifically for showing Koi properly and most importantly — safely! The lagoons are not temporary, removable vats but permanently built into the ground and constructed in concrete, complete with full scale biological filtration systems which will ensure each and every Koi in each and every Show Vat will have fully filtered, constantly circulating, heavily-aerated water.

This project has only been possible through a unique collaboration with Haydock Park Racecourse Ltd, which has enabled UKoi to construct a permanent, purpose-built show arena which includes the complex of Show Lagoons which have been designed solely to provide exhibited Koi with absolutely top notch water quality. Using this level of technology is the only way UKoi believe they can deliver their pledge of absolutely uncompromising water quality.

There is only one style of show format that offers meaningful competition and a fantastic spectacle — that is Japanese-style, with Koi of the same size and variety exhibited together. All exhibitors will be invited to preregister and this process will include strict benching health requirements.

The Show will be completely

open — anyone who registers can enter UKoi '97. There will be benching fees — they will not be nominal nor will they be unreasonable but they are designed to reflect the nature and quality of the Show which will have some impressive prizes including Japan fights — but the big prizes are not just for big winners — some minor award winners will get major prizes, too. This is designed to encourage hobbyists at all levels to enter and participate in the first of a new generation of Koi Show. In addition to the show, UKoi will have many of Europe's top manufacturers and Koi dealers present — in fact, if it's Koi related it will be at UKoi '97.

UKoi '97 has been professionally designed, developed and meticulously planned by Koi professionals for everyone interested in Koi to enjoy. More details of the Show will be released shortly so keep reading A&P.

In the meantime, if you want to receive Show details direct or to register to exhibit your Koi — call up the UKoi '97 registration hotline: 01942 724896.

Information supplied by: Nishikigoi International Ltd, Halton House, Rosedale Avenue, Lowton, Warrington, Cheshire, WA3 2RW. Tel: 01942 726864. Fax: 01942 723914.

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Aquatic courses

With the expanding number of retail aquatic outlets, the demand for qualified staff is also enjoying a proportionate increase so putting extra demands on the relevant training

establishments to provide such staff.

HARTPURY COLLEGE in Gloucestershire organise Aquatic Workshops ranging from six-day courses (over a period of six weeks) to a 30-day course (over 30 weeks). Subjects

include 'Aquariums Explained', 'The Water Garden' and College Certificate in 'Aquatics Management'.

The next Course to start is 'The Water Garden' which is set to run from 6 March for the next six Thursdays, at 7pm-9pm.



The Course Fee is £50.

Hartpury College is just five miles outside Gloucester, set in a 450 acre country estate. For further details of course please contact the College, Hartpury

House, near Gloucester GL19 3BE. Telephone 01452 700032. Fax 01452 700629.

SPARSHOLT COLLEGE is a long-established centre for aquatics courses and they too have Short Courses beginning in the New Year. Appropriately, The Pond and Aquarium Plant Husbandry and Pond Planning and Design Courses take place on 13/14 February and 23/24 January. Each two-day Course costs £100 but successive Courses attract a discount, thus the two Courses mentioned, if taken together, cost £190.

Short Course qualifications count, in some areas, towards Animal Husbandry Certificates needed to obtain Pet Store Licences.

Full details of all Courses are available from Fiona C. Fielder, Short Course Administrator, Sparsholt College Hampshire, Sparsholt, Winchester, Hampshire SO21 2NF. Tel: 01962 797276. Fax: 01962 776587.

It's that Koi again!

In this column in last month's A&P we brought news of a monster Koi. We now bring you more details, a picture of it and a chance to name it!

One of the few varieties of Koi that do grow consistently large and very occasionally hit the magic 1m mark are Chagoi. So when the 36in Chagoi that arrived at Norwood Fisheries in October arrived everyone agreed it was BIG.

That was until mid November when the longest Koi ever to be imported into the UK arrived at Norwood — a staggering 42in monster Chagoi!

The leviathan weighs an incredible 115lbs and is a genuine 42in long. As if that were not impressive enough the Koi is also excellent quality with beautiful scalation and almost perfect shape. Within 24 hours of arriving in its purpose built 4ft 6in reinforced packing case the superb Koi was happily hand feeding.

David Sanders, MD of Norwood Fisheries, who bought the Koi on his latest trip to Japan, commented: 'I'm afraid it was love at first sight. I have never seen anything so majestic and beautiful. This truly unique Chagoi has a beguiling quality and gentleness that instantly endears her to everyone who sees her. All our customers think she is magic and we all hope no-one ever wants to buy her because we want to keep her!'

This unique Koi encompasses two of the attributes which render Chagoi so popular. Firstly their exceptionally quick growth rate and their potential to grow exceptionally large, and secondly their amazing gentle friendliness.

When viewing the amazing Norwood gentle giant it's not hard to understand why many Japanese Koi enthusiasts insist that no collection of Koi is complete without a Chagoi.

Norwood are also running a free to enter, no purchase necessary, competition open to all Norwood visitors to find an appropriate name for their new Koi. The final choice of name will be made by Norwood staff from ideas submitted by visitors and the person who suggests the chosen name will get a

fantastic Norwood Koi. Everyone is welcome to visit and see this incredible Koi and the 'Name the Chagoi' Contest is open to all Norwood visitors.

This very special Koi is a must see for all serious Koi enthusiasts as it really is a unique Koi, so if you have not yet visited Norwood drop in to see the longest Koi in Europe, not to mention some of the best in the country courtesy of the newly arrived Norwood Autumn/Winter collection of great value Koi.

Norwood Fisheries is located south of Sheffield just a couple of miles from M1 junction 31. Take the A57 following signs for the Rother Valley Country Park, turning left onto the A618 (Mansfield Road) Norwood is just over a mile on the left.

For more information or details contact: Norwood Fisheries, The Mill, Norwood Lock, Norwood, Killamarsh, Sheffield. Tel: 01909 515183. Fax: 01909 770606.



SHORE WATCH



BY
**ANDY
HORTON**

Air temperature

January is mostly too cold to go down to the shore to explore the life in the pools, both for the rockpooter, who can always wrap up in some old winter wear, but more importantly it is also too cold for the seashore life around Britain. All of the rock pool fish and most of the crabs will be resident in the deeper, warmer water. Air temperature is the important factor.

An icy northerly wind can quickly cool the pools to near freezing point, and if the temperature of the pools falls to minus 1.87°C the pools will actually freeze. This would be very rare in the south but could conceivably occur in upper shore pools on Scottish coasts.

The average air temperature during January is about 2°C on the eastern English Channel coast and at about 1.5°C on the North Sea coast with annual fluctuations, but because of the lesser specific heat of air the temperature

Common Starfish, *Asterias rubens*. The Common Starfish is a species found in a shallow water from Arctic Norway where the temperatures may fall to 2°C, all around the British Isles, and as far south as Portugal where the temperature may reach 22°C. This is the temperature range in which this starfish can be kept.

PHOTO: ANDY HORTON

Happy New Year! In the column for the coming year I will examine some aspects of the biology and behaviour of

can vary much more quickly than the open sea. In Cornwall the mean air temperature in January has an average of 5°C, so the fish and crabs may still remain on the shore during this month.

Sea temperature

The higher specific heat of water compared to air means that the sea will heat up and cool down much more slowly than the air, and during January the

the rock pool fish and marine invertebrates that are both interesting and useful knowledge for aquarists.

sea is likely to be warmer than the air. Although the sea temperatures at the surface vary by a few degrees each year the average sea temperatures at Plymouth in January is 9°C, at Brighton 8°C and at Newcastle only 5.5°C. However, this is higher than the average air temperature.

Northern species like the snake-like Butterfish or Gunnel, *Pholis gunnellus*, or on the east coast the Eelpout, *Zoarces viviparus*, may be found between

the tides during January. There are other factors like the prevalent gales and rainfall that dilutes the pools that make the shore an inhospitable place for marine fish.

Temperature amplitude

How does this effect the aquarist? Simply, every organism can only survive between certain temperature tolerances. These are quite often only a narrow range for marine organisms. Because the sea does not vary much in temperature they have not evolved to withstand great variations.

Alas, as far as the aquarist is concerned, the temperature in his aquarium will quickly equal the ambient air temperature unless a heater or cooler is installed.

Research

Tropical aquarists rarely have any problem with temperature because the retailer should know the optimum temperature in which the fish can live. The variations in the water temperature in the tropics are much smaller.

Aquarists keeping British marine life have to resort to research. This is undertaken in two



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Please send reports to: Shore Watch Reports, British Marine Life Study Society, Glaucus House, 14 Corbyn Crescent, Shoreham-by-Sea, Sussex. BN43 6PQ.

If you are in doubt about the identification of any species please say so and give as full a description as possible. If you know the scientific name please use it as well as the common name. All letters will be replied to. If you want a complimentary copy of the journal *Glaucus* with your reply, please enclose stamps for a letter up to 200g (43 pence or 57 pence).

Bullhead, *Tourulus bubalis*. This Arctic species reaches its most southerly point of the distribution on the coasts of the English Channel. Adult fish cannot be kept in temperatures exceeding 22°C.

PHOTO: ANDY HORTON



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stages. The first is to find out the distribution range of the fish or invertebrate in a high quality identification guide. The second stage is to find out the minimum and maximum sea temperatures in the sea at the two edges of its distribution range, and then calculate the range in which the fish can live.

Temperature variations

Even within its natural tolerance fish and other invertebrates are unable to survive rapid and large variations, over 2°C, in a short period of time. This is likely to occur when an aquarist is transporting fish home and putting them in a tank which is significantly warmer or colder than the bag or bucket in which the fish is being carried. There are just one or two exceptions like the rock pool fish called blennies which can withstand a 5°C sudden fall. This may occur in the wild when the tide comes in and refreshes the pools in which they were living.

Temperature related variables

Two variables are important to the aquarist:

DISSOLVED OXYGEN

Sea water becomes saturated with dissolved oxygen and as the temperature increases the amount it can hold decreases according to the following table:

Salinity 3.4 per cent (North Sea)

Maximum levels of dissolved oxygen at different temperatures.

°C	°F	100%	70% O ₂ (dissolved oxygen mg/l)	= saturation level
28	82	6.4	4.5	
26	79	6.6	4.6	
24	75	6.9	4.8	
22	72	7.1	5.0	
20	68	7.4	5.1	
18	64	7.6	5.3	
16	61	7.9	5.5	
14	57	8.3	5.8	
12	54	8.6	6.0	
10	50	9.0	6.3	
8	46	9.4	6.6	

Higher amounts of dissolved oxygen are found in freshwater.

If the gas is not renewed from the atmosphere as quickly as it used up the fish and other animals will suffocate. Stocking levels need to be lower at higher temperatures.

SPECIFIC GRAVITY

The specific gravity of the water decreases with increasing temperature when the salinity remains constant. The denser water will show a higher reading on the hydrometer according to the following scale:

Specific gravity of seawater with a salinity of 3.4 per cent

Temperature:

6°-8°C = 1.027
9°-13°C = 1.026
14°-18°C = 1.025
19°-21°C = 1.024
22°-25°C = 1.023
26°-28°C = 1.022
29°-30°C = 1.021

The ability of fish to tolerate changes in salinity varies with different species. Invertebrates, especially anemones, will not thrive in reduced salinities. As a very rough guide a specific gravity reading of 0.001

corresponds approximately to a 0.1 per cent alteration in salinity, and this variation is the tolerance limit. Water with a salinity of less than 3.0 per cent is defined as brackish; and in excess of 3.7 per cent as mesohaline, and likely to be found only in enclosed lagoons.

SEA TEMPERATURE RANGES WORLDWIDE

Surface seawater temperatures:

Temperature range	°C
Arctic Ocean	-2 to 5
North Scotland	5 to 13
Newcastle	6 to 14
English Channel	7 to 17
North Spain	11 to 20
Gibraltar	14 to 21
Cyprus	18 to 27
Hawaii	20 to 22
Caribbean Sea	23 to 25
Great Barrier Reef	23 to 26
Indian Ocean	24 to 28
Philippines	26 to 28
Persian Gulf	20 to 30
Shallow Persian Gulf	to 35

These temperatures are taken at the surface and cover and in some cases cover a wide range of ocean. To ascertain the precise requirements of a particular fish more accurate measurements may be necessary.

The sun only warms the oceans down to depth of 550 metres. As the average depth of the sea is 3,729 metres, it follows that the great depths are only kept warm by water circulation and mixing. The abyssal depths are above the vast ocean plains that cover the ocean floor and vary in temperature between 1°C and 5°C. It is the warmer, shallow waters close to land over the Continental Shelf that contain most of the marine life.

Beadlet Anemone, *Actinia equina*. This anemone is found on the eastern coast of the Atlantic Ocean from the polar circle to the equator. It has been suggested that there are different ecotypes based on temperature amplitude, but all anemones collected in the English Channel will survive between freezing point up to 28°C.

PHOTO: ANDY HORTON





The Aquatic Plants of South America



Echinodora bleberi



Caremba aquatica

BARRY JAMES FINDS SOME APPROPRIATE PLANT SPECIES
FOR THAT SOUTH AMERICAN AQUARIUM

PHOTOGRAPHS BY THE AUTHOR

South America was once joined to Africa and having migrated over millions of years to its present position was later joined to the continent of North America by the isthmus of Central America. The flora and fauna of North America therefore differs considerably from the southern continent but a certain amount of mixing was bound to have occurred over time with Mexico occupying an intermediate position between the continents as far as its plants and animals are concerned.

The island chain of the West Indies extends from Florida to the mouth of the Orinoco and its flora seems to have originated from South America. The aquatic flora shows a remarkable similarity throughout with certain genera being dominant from North to South and from East to West but showing great diversity in their physiology to cope with the different climatic zones.

As far as the aquarist is concerned it is the tropical belt which holds the main interest as most of the fishes and plants from this continent are endemic to this region. South America shows a quite simple division in its topography. To the West lie find a relatively narrow mountain ranges of the Andes.

To the East are the vast alluvial plains interspersed by mountains and plateaus. The climate as one would expect is not uniform. The equatorial lowland climate of the

Amazon basin, the tropical oceanic of the coastal regions and the tropical inland climate of the mountains are succeeded by the varying climatic zones of the Andes which vary according to height. In addition there are other unique areas such as the deserts of Chile and the savannah conditions of Argentina.

Most of our South American aquatics are drawn from an area stretching from Northern Argentina to the coastlands of Colombia, Venezuela and British Guyana with a few species from Central America and Mexico.

Aquatic plants are thinly distributed in the dense jungle areas of the Amazon, being found in quantity only in the lateral arms and lagoons of the main river systems. It is in the streams and ponds of the more open country near to the coast that they reach their greatest abundance.

The Amazon region is characterised by extremely high temperatures which average around 77°F, being hotter in the dry seasons than in the wet. However the variation, both seasonal and geographical, can vary by as much as 40°F. The big rivers, however, remain stable at between 82-86°F.

South America is rich in aquatic plant species compared with the African continent. However, it has only representatives of about a dozen families.

It is poor in aroids which are capable of permanent submersion. However, it is rich in members of the Alismataceae of which *Sagittaria* and *Echinodorus* are the stars of the show. *Cabomba* also have their home here of which nearly all the species are confined to this continent. It is the centre, too, of the aquatic members of the Scophulariaceae to which the genus *Bacopa* belongs. Among other important genera are *Egeria*, *Elodea*, *Mayaca*, *Heteranthera*, *Eicchornia* and *Limnobium*.

Being such a large continent, large areas remain unexplored by collectors and so many new species will be found and introduced to the aquarium world. In the last few years many new *Echinodorus* have been found and some have been sent to nurseries for evaluation and possible propagation. Central America, too, may have some surprises in store and it seems only yesterday that *Shinnersia rivularis* — the Oak Leaf Plant — was introduced from Mexico.

Although the water and substrate conditions vary widely across the continent, South American aquatics enjoy similar conditions to the aquatic plants from other continents, with which they will mix quite happily in most cases.

However, the larger *Echinodorus* are often used wrongly in aquaria. They are naturally rosette forming plants which,

because of their size, are best employed in the middle ground as accent or specimen plants. All too often you see several specimens lined up across the rear of the aquarium as a background screen. The result is that they become very untidy as they try and grow as nature intended. The smaller species are often confused with *Sagittaria* to which they are related but members of both genera need good illumination if they are to do well. They do not thrive in the foreground of deep aquaria unless the light is adequate for their needs.

Cabomba species too, often fail for lack of the necessary requirements for optimum growth. Red *Cabomba* (*Cabomba pialhyensis*) seldom succeeds in aquaria because of its high lighting requirements. Green *Cabomba* (*Cabomba caroliniana*) is an easy plant, but as often as not breaks up without rooting, when first introduced into aquaria. The trick is to let it float for a couple of weeks or so before planting; during this time the cuttings will produce roots from the nodes at intervals along the stem. Then, and only then, should the stems be planted into the substrate.

Amazon Swords often shed their outer leaves when re-planted. The imported plants are grown emerse and when planted underwater these leaves first develop brown spots and then die but if conditions are right they will soon be replaced by softer submerged foliage.

Jackie's Juniors



HI JUNIOR FISHKEEPERS.

It seems as if the word is spreading. I have recently received news of yet another Junior Fishkeeping Group which has been started up, this time at Havelock Junior School in Desborough, near Corby.

The group developed after the Headmaster, Ronald Evans, appealed for an aquarium for the school. Tina and Keith Dorwell have a daughter, Samantha, at the school and coincidentally are both members of Corby Aquarist Society so they decided to see what they could do to help.

A call to Ralf C. Hagen, the pet product supplier especially known for its aquatic products and willingness to help, brought a very welcome donation in the shape of an aquarium on stand, complete with heating and lighting systems. A special assembly was held at the School on 16 December to mark the unveiling of the aquarium, which will be an attractive resource in the School Library both as a visual attraction and also as a teaching aid. Already one or two meetings have been held with children and parents seeking to form a regular fishkeeping group at the School.

It's nice to hear of such aims having a happy outcome and I look forward to hearing of the group's fishkeeping progress in the future.

Here are two Puzzles for you to solve: one is the normal Word Search whilst the other is a 'fishy' version of 'Pin the Tail on the Donkey'.

All you have to do is circle the listed words hidden in the Word Search square (don't forget words can be backwards, forwards, up, down or even diagonal. Hyphenated words are split in the grid.

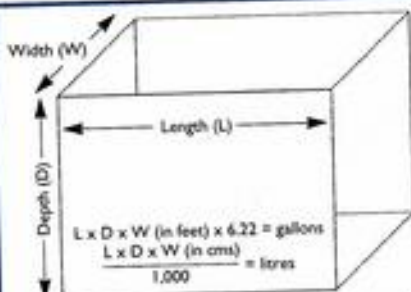
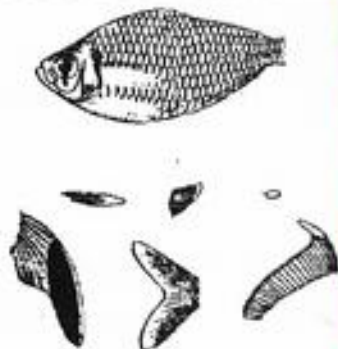
WORD SEARCH



WORDS TO FIND

ANCISTRUS	LIMIA
LIGHT	GRAVEL
RED-SWORD	TETRA
BLIND-CAVE-FISH	PLATY
PLANT	EEL
ELECTRIC	GOLD-FISH
FILTERS	BLACK-MOLLY

Use your imagination (unless you feel like tracing the outlines) to put the fins back on this poor Tetra. All the fins are supplied; some may be twisted round a little but none are back to front! Don't forget to use all of them!
(ANSWERS ON PAGE 74)



Now some helpful tips. If someone asks you how much water your aquarium holds, do you know how to work it out?

Multiply the length by the depth by the breadth and follow these directions according to which scale of measurement you prefer to use.

Can you change gallons to litres, or litres to gallons?

To convert gallons to litres multiply by 4.546. To convert litres to gallons divide by 4.546 OR multiply by 0.22

What about temperature?

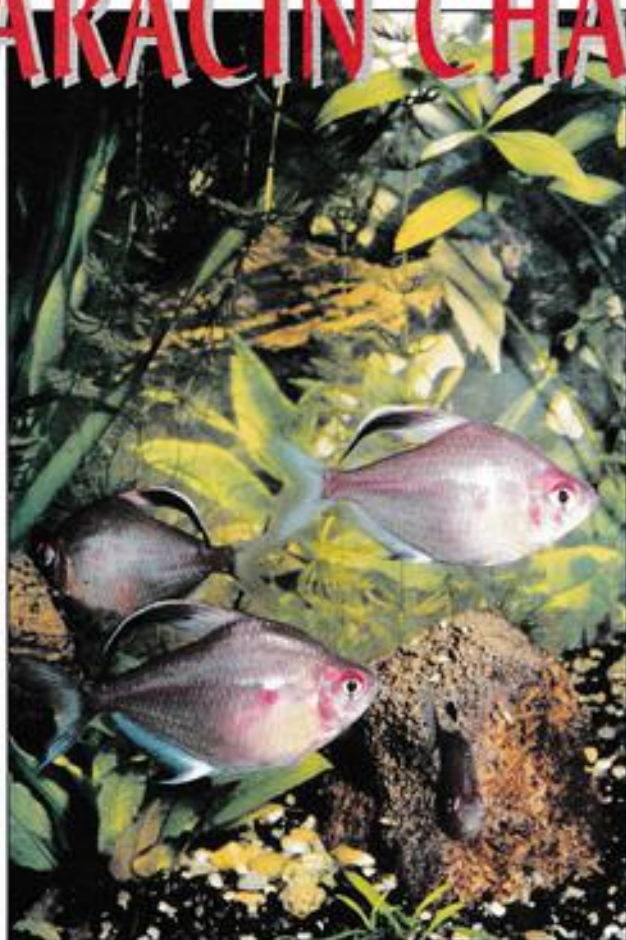
To convert Centigrade to Fahrenheit: $\frac{\text{Centigrade} \times 9}{5}$ add 32 = Fahrenheit

To convert Fahrenheit to Centigrade: Fahrenheit take away 32 $\times \frac{5}{9}$ = Centigrade

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



CHARACIN CHARM



Hyphessobrycon erythrinoptera,
the Bleeding Heart Tetra.

It would not, I think, be over presumptuous to suggest that it might be extremely difficult, if not impossible, to find anywhere an aquarium containing small freshwater tropical community fishes that did not include at least some representatives of the Characin fraternity. This is perhaps not so surprising

ROY OSMINT SELECTS A FEW VERY DECORATIVE SPECIES FROM THE HUGE RANGE AVAILABLE

PHOTOGRAPHS BY M.P. & C. PIEDNOIR

when it is realised that Characidae form one of the largest families of freshwater fishes and contains some of the most attractive species found in the fishkeeping

hobby.

This group of fishes which is in fact made up of various closely related families belong to the great order Cypriniformes which

incorporate all Carps, catfishes, Cyprinid and Loaches among others and which together account for something in the region of 75 per cent of all freshwater fishes throughout the world.

Unlike some fish families that often exhibit basic characteristic similarities such as perhaps size, body shape and temperament as well as possibly habit or habitat that might be

described as being fairly typical to all members.

Characins tend to display some quite widely contrasting variations. An extreme example would be the tiny much loved Neon Tetra (*Paracheirodon innesi*) compared to the relatively huge Pacu

(*Colossoma nigripinnis*). Other contraries include the streamlined torpedo shaped family Anostomidae against the curiously deep bodied Hatchetfishes, Gasteropelecidae. While the delicate peaceful nature of the Glowlight Tetra (*Hemigrammus erythrozonus*) appears in complete contrast to the fearful, if not sometimes exaggerated, bloodthirsty reputation of the Piranha *Serrasalmo*.

Uniformity, however, does exist with all Characins possessing teeth and most having an additional fin, the adipose located between the dorsal and tail fins. This extra fin of questionable purpose is not exclusive though to the family Characidae with certain other fishes notably Salmon and Trout also being endowed with this particular appendage.

There are other areas of uniformity, too, for instance there is a complete absence of real spines in the dorsal and anal fins of all Characins and the ventral fin pairing is positioned well back on the fish's body. These characteristics are associated with the Characin's relatively primitive status in evolutionary progression compared to say the more modern Cichlids which do have well developed fin spines and ventrals set much further forward.

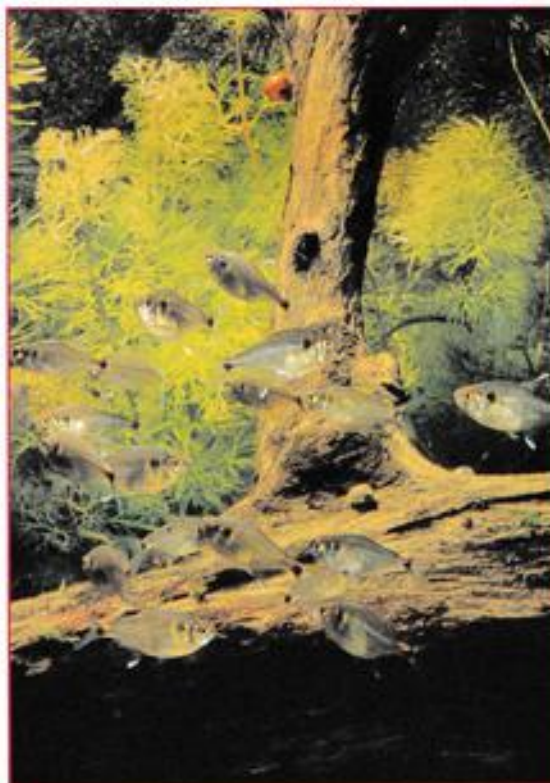


ABOVE
Hyplessobrycon serpaet.

BELOW
Hemigrammus ocellifer, the Head and Tail-light, or Beacon Tetra.

One other feature that Characins have in common along with all other

members of the Super Order to which they belong is an internal structure known as



the Weberian Apparatus named after its discoverer Ernst Heinrich Weber.

This complex mechanism provides a connection between the swim-bladder and inner ear and is thought to act like a highly sophisticated hearing aid by allowing vibrations to

be transmitted along it, but there is still much to learn about this remarkable apparatus.

Characins have a great deal to commend them so far as the aquarist is concerned with many lovely, peaceful, tolerant and interesting subjects widely available. Even non-enthusiasts seldom fail to marvel at the striking beauty of varieties like Cardinal, Neon and Glowlight Tetras when observed in the crystal waters of a well furnished aquarium. In fact the hobby undoubtedly owes a considerable debt of gratitude to these particular living jewels for they have probably initially attracted more people's attention and been responsible for converting a greater number of newcomers to the fishkeeping ranks than almost any other species. How many countless youngsters, for instance, have had the first spark of enthusiasm ignited by these beauties? An inspiration that in many cases will have led to an absorbing and fulfilling lifelong interest.

Characin as a general rule have a natural inclination to form a shoal, this is particularly so in the case of Tetras and it is part of a social structure that should not be overlooked by the fishkeeper. All too often when purchasing these fishes

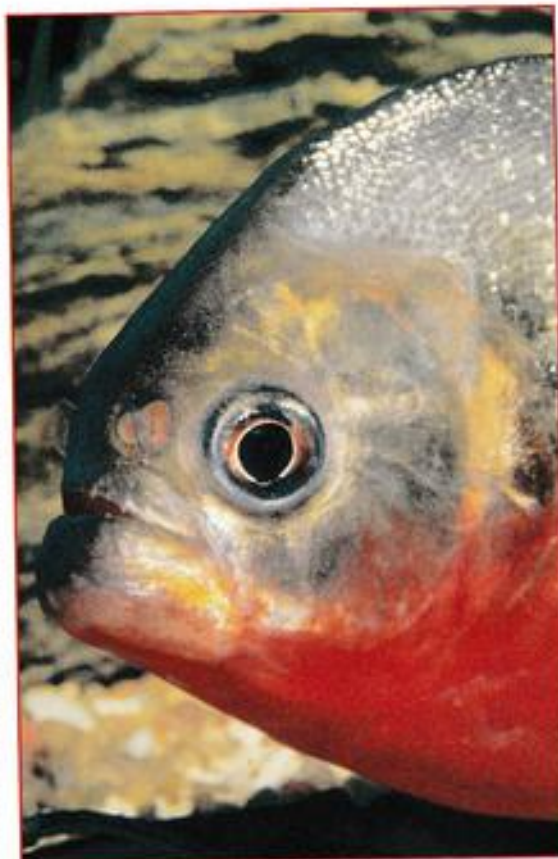


for a small community aquarium there is an understandable, though misguided, tendency to obtain two of this and a pair of that in an effort to maximise the number of different varieties that can be kept. This is a temptation that should be resisted, eight or ten of a particular species being a far more satisfactory number. I have also found that Characins that are denied the opportunity to shoal often seem to vent their frustrations by using their teeth on the fins of other members of the community to a greater extent than otherwise is the case.

The probable reason for this is that when part of a sizeable shoal the fish establish a disciplined pecking order with each member having and knowing their place within the social structure and are consequently more contented.

Furthermore, should an individual fish become an outcast it is less likely to be bullied when part of a larger group as its presence will be less conspicuous in the crowd — in other words safety in numbers.

Although as we know all Characins possess teeth (albeit only in the upper jaw in some varieties) and therefore obviously have the potential to use them, in practice few problems should be experienced with the majority of the numerous forms offered to the aquarist when reasonable conditions are provided. A few species have gained a reputation as being fin nippers and know doubt different aquarists will have their own stories on the



Senegalus nattereri.

subject. My own experience with the varieties that I have kept over the years is that I have encountered little difficulty, if I had to name one that has proved more persistent in this respect than others it would probably be the Serpae Tetra (*Hyphessobrycon serpae*).

Characins occur naturally in South and Central America with some also native to North America and Central Africa. It is, however, the vast Amazon Basin that is home to most

of the varieties that populate small aquaria, where they frequently inhabit shallow pools and streams shaded from the sun by dense overhanging vegetation, the tropical rainfall continually freshening the soft acid water.

The many species of Characin Tetras now available to the hobby at relatively moderate cost make these fishes almost indispensable for the small to medium community aquarium. Nevertheless, it is

sensible to shop around to compare quality and price as both can vary considerably among different retail outlets. Don't necessarily go for large fully developed specimens.

My own particular favourites of Tetra include the ever-popular Neon (*Paracheirodon innesi*) and Cardinal (*Paracheirodon axelrodi*) which so far as freshwater tropicals are concerned are unsurpassed in the electric brilliance of their colours. Glowlights (*Hemigrammus crysoleucos*), Head and Tail Lights (*Hemigrammus ocellifer*), Black Neons (*Hyphessobrycon herbertaxelrodi*), Emperors (*Nematobrycon palmeri*) and Lemon Tetras (*Hyphessobrycon pulchripinnis*) though perhaps not so strikingly vivid as their more colourful cousins are no less appealing and create an enchanting display.

All of these and many more are perfectly compatible in sufficient numbers and will grace any community of small fishes. I also very much favour the idea of a single species tank which if tastefully and appropriately decorated can look quite outstanding. This set-up, also, of course has the advantage of enabling the chosen species to be observed and studied in great detail and practical knowledge acquired that would otherwise not be possible. For me there are few more magical sights than a really large shoal of a single variety of Tetra swimming as one through crystal water.

Ideally the water in the Tetra tank should be soft



the species entirely depended upon its ability to adapt by other body senses becoming more acute and compensating for the complete loss of sight.

Gradually over generations it became increasingly attuned to a world of blackness, learning to navigate and locate food with uncanny precision using other enhanced senses,

LEFT

Hemigrammus erythrozonus, the Glowlight Tetra.

BELOW

Nematobrycon palmeri, the Emperor Tetra.

and on the acid side. Delicate leaved plants complement the elegant motion of the fishes perfectly and a nice piece of natural bogwood really does create the right effect although textured rock can also look very impressive. The aquarium should preferably have a darkish backdrop and the lighting be subdued. This not only shows the fishes off to best advantage but also approximates the natural habitat. In practice, however, most species are fairly tolerant and so long as water quality is maintained to a high standard there should not be too many problems. Conditions do become more critical in many cases where a spawning is contemplated.

Although Tetras are undoubtedly the most commonly seen of the Characin group there are many other interesting subjects among the related

fishes that make up this diverse family. The majority are very accommodating in their requirements whilst some do have need of a rather more specialised approach so there really is something for everyone.

A species which I have always found a source of fascination is the Blind Cave Fish (*Atypax*) although for many its appeal might lie in its curiosity value rather than perhaps its actual beauty. Its story is a remarkable one and presents a clear example of the way evolution has enabled survival against the odds in an apparently hostile environment. Originally as a result of geological movement probably brought about by earth tremors, ancestors of the Cave Fish became inextricably trapped within subterranean streams in the Mexican Province of San Luis Potosi.

Confined to a total and permanent darkness with vision impossible survival of



especially the 'sixth sense' lateral line complex. The eyes now completely redundant were lost, the sockets being covered by skin as the fish developed from fry to adulthood.

The Blind Cave Fish is peaceful and easy to keep with other similar-sized fishes although it is probably more contented in a species tank furnished with high rocky caves and a sandy bottom where it will continuously search for food, its sightless frame avoiding obstacles with truly remarkable dexterity.

Another group of South American Characoids of the genus *Nannostomus* commonly referred to as Pencilfishes, due to their elongated body design, are also of considerable interest for they contain some most exquisitely coloured and decorated subjects. They are on the whole a peaceful company of fishes and make lovely aquarium inhabitants. They do, however, need to be watched, particularly when first introduced, as occasionally some will develop aggressive tendencies with individual specimens sometimes becoming quite belligerent. This is especially so with rival males at breeding time. It is also wise to avoid housing them with long, elaborately finned tank mates as these may prove just too tempting to resist.

Most varieties of Pencilfishes prefer a tank laid out with some areas of fairly dense vegetation although there should also be plenty of open swimming space. In common with Characoids generally these are predominantly a shoaling species and will be seen at their best when permitted these circumstances.

Something of an oddity are the various Hatchetfishes of the related family *Gasteropeleidae* and they make fascinating occupants for the larger aquarium as they prefer plenty of free swimming space. They are

surface dwellers and easily capable of flying out of the aquarium, it must always therefore be closely covered. I purposely use the term flying as opposed to jumping to lead on to the point that these curious characters with their rather ungainly appearance are probably capable of true flight by definition. Despite the incredible airborne performances of the well known flying fishes of the oceans it is likely that these creatures do not actually vibrate their large pectoral wings in such a manner as to contribute to forward propulsion whilst in the air and thus do not achieve real flight — gliding probably being a more accurate description. Our Hatchetfishes, on the other hand, equipped with pectoral fins operated by extremely powerful muscles which can be beaten with great rapidity whilst airborne, are able to achieve true flight for distances of up to some 5m.

Characins as a general rule appear to have enormous appetites and seem forever hungry: this is because in the main they are a very active family of fishes and consequently burn up energy at a greater rate than their more leisurely cousins. Although in nature most are carnivorous (remember the Piranha), the majority of small to medium forms will readily accept the usual staple aquarium flake. They will, however, always greatly appreciate this being regularly supplemented by live foods such as Bloodworm and *Daphnia* which they take with unrestrained enthusiasm — freeze-dried alternatives are a satisfactory substitute if you prefer.

Take a bit of time and trouble to provide these lovely fishes with favourable conditions and circumstances and your efforts will be richly rewarded — for only then will you experience the true Characin Charm.

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IN A PREVIOUS ISSUE
OF A&P

**MARIE-PAULE &
CHRISTIAN
PIEDNOIR**

DESCRIBED THE
BEHAVIOUR OF THE
SHELL-DWELLERS IN
THEIR SMALL
TANGANYIKAN TANK

PHOTOGRAPHS BY THE AUTHORS

FOLLOW 'Canoeing' in

Continuing the tour of our fish room, this time we will pause in front of an Amazonian aquarium. This was set up in 1990 and is populated with species from that fantastic part of the world, the Amazon basin: Characins, *Leviniid* Catfishes and a suitable selection of cichlids.

THE SET UP

The tank is one of a group of six, three different biotope tanks of 490 litres apiece and three of 250 litres which are used for new arrivals and for growing plants. They are arranged in an L-shape with tanks on two levels. The Amazonian tank, which has a habitable volume of 380 litres (the built-in filter occupies a further 100 litres) is of all-glass construction, home-made from 8mm glass, which was, however, cut and drilled professionally.

Its exact dimensions are 130x60x55cm deep — the maximum water depth is 50cm. The whole is reinforced by a central strap 150mm wide across the width of the tank and two further 30mm wide glass strips along its length (these support the cover). The filter compartment measures

MAIN PICTURE
Amazonian aquarium with
Discus, Cardinals and Angelfish.

RIGHT
Petrolia species.

50cm long x 40cm wide and 55cm deep and is attached to one of the short sides of the aquarium, which has been drilled with two 20mm diameter holes. It is attached in such a way that it can be used to simultaneously filter a second aquarium positioned at right-angles to the first. The saving in space is considerable and the two tanks look like one.

The stand consists of breeze-blocks to which are glued two 50mm square section tubes with a thickness of 5mm.

Each of these tubes must weigh at least 10kg and they do not bend significantly under the weight of the filled tank.

The whole is topped with a sheet of 19mm thick marine plywood and the tank rests on a 20mm thick layer of polystyrene. There is room for one of the 250 litre tanks beneath this construction, forming a lower storey.

There is no hood as such, the tank being covered with sheets of polycarbonate



which are intended merely to minimise evaporation and to stop the fishes from imitating Exocet missiles!

The lighting consists of three 120cm fluorescent tubes, a Trilux and Ultra-

Trilux from Penaplex, sited above the polycarbonate sheets and fitted with waterproof end caps. The period of illumination is about 13 hours per day. The lighting comes on and goes off in two stages, courtesy of a twin time-switch providing an interval of half an hour; a blue nightlight takes over at night. We feel that this arrangement is essential, not only for the well-being of the fishes, and to allow them to guard their eggs and young, but also for their very survival. In the past we have lost Angelfishes through heart failure caused by the lighting going off too suddenly. When we relate such incidents to visitors (aquarists or not) we are gently teased about our anthropomorphism!

The decor, like that in our photographic aquaria, consists of a background of polyurethane resin into

THE LEADER Amazonia



which, at the moment of expansion, we embedded pieces of cork bark which had previously been boiled and then dried at high temperature in the furnace of a friend who is a glass-blower. The whole was given coats of resin, coloured grey to disguise the yellow of the polyurethane, but left clear over the cork bark. This decoration (which is now hidden by the plants!) conceals the back glass and the side where the filter is positioned. The aquarium can thus be viewed from the other sides. The interior decor, so to speak, consists of large root-shaped pieces of bogwood (aged sufficiently to ensure they no longer release tannins), several lumps of non-calcareous rock and some small pebbles.

The vegetation provides the finishing touches, hiding everything else; since this decor was first installed several of the stones have been removed increasing the volume of water appreciably. The filter uses the settlement method which in our experience is the best method. The media used are Eltfix (from Eheim), Perlton and blue open-celled foam. A bag of activated carbon ensures that the water is crystal clear. A submersible pump with a turnover rate of 800 litres per hour is used instead of an airlift to return the clean water. The turnover rate of 800 litres per hour is considerably reduced by the length of the return pipe which is about 140cm. The filter media are cleaned one at a time at the rate of one per month and 30 per cent of the water is changed every three weeks.

The heating consists of a

150 watt heater positioned next to the filter pump. The temperature is maintained at 26°C.

The water is straight from the tap and has a total hardness of 22 degrees (French), the pH is 7.2. We realise that it is absolute heresy to maintain Amazonian fishes in this sort of water but they are alive and thriving! It is not our ambition to breed them. We save our consciences with occasional, very irregular, additions of rain water collected from the down-pipe from the gutter.

Before listing the different species of plants we would like to point out that creating a planted aquarium involves a not inconsiderable investment, not only of money, but also of the time required for their successful cultivation. But the results are well worth it ...!

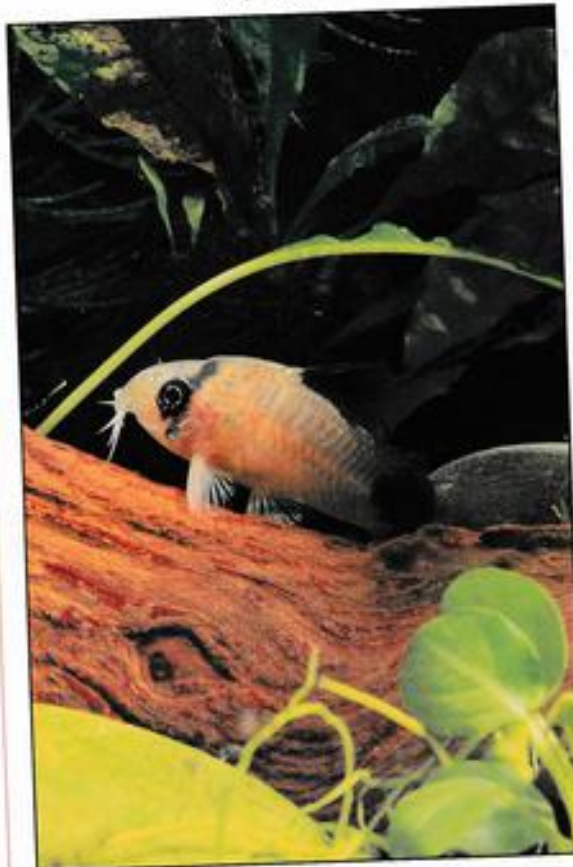
Let us begin at the beginning and consider the substrate. This is a mixture of fine river sand (of the sort which is used for swimming pool filters) and Aqualit, half and half. Generally speaking, this substrate has given good results even with fishes of

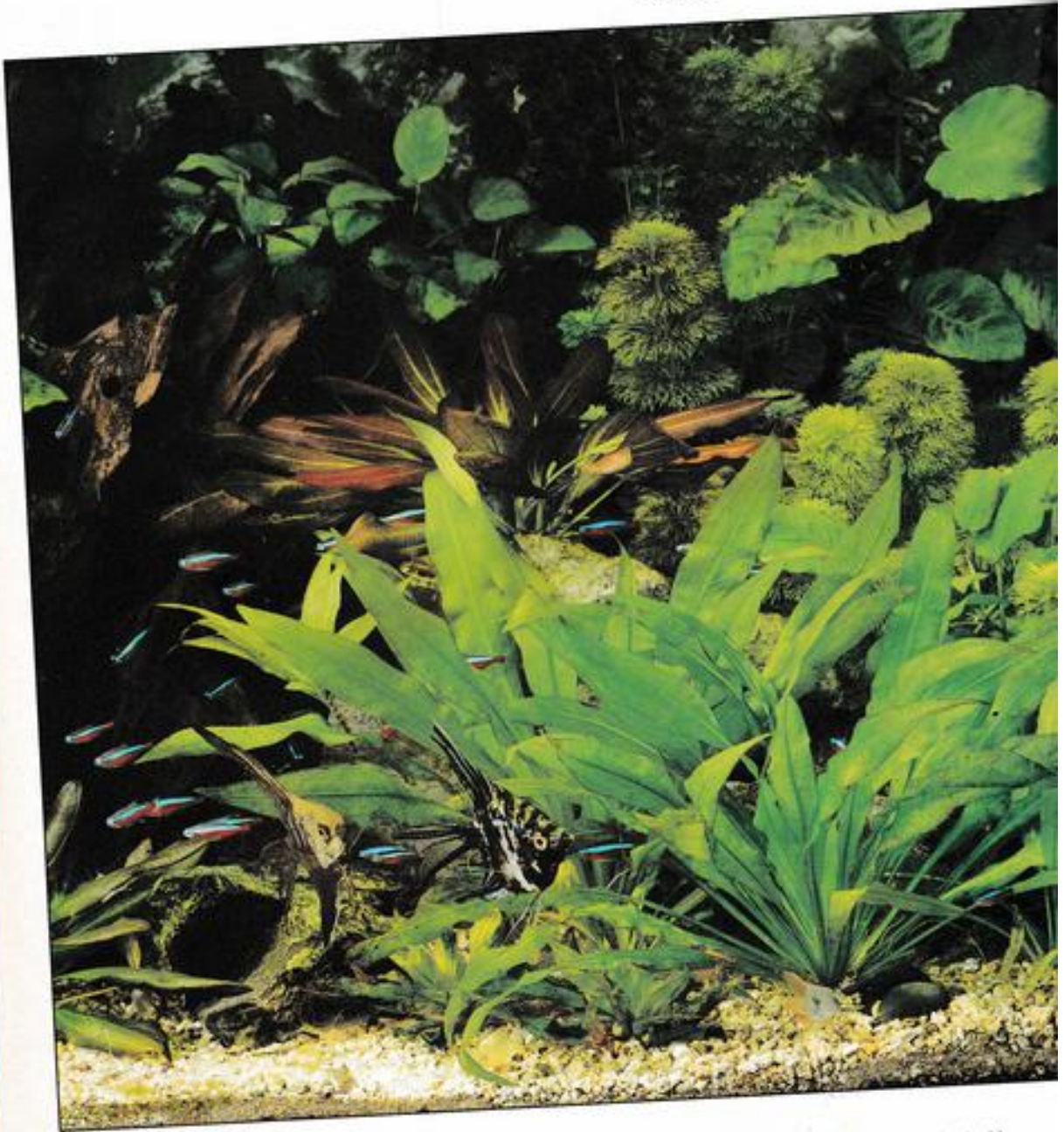
moderate size which are inclined to make minor excavations such as *Loricariids* and small cichlids. Some plants, such as *Echinodorus*, which have a high nutrient requirement, are cultivated in pots to permit the use of a more nutrient-rich compost. We have deliberately used a mixture of plants of different geographical origins. Perhaps we should add that we plant our tanks, even this so-called 'Amazonian' one, with those plants that we are successful in growing! This is the best approach, for there are some aquarium plants which, just like some garden plants and some animals, don't like some people! It is a great shame that this point about compatibility has never, or hardly ever, been touched upon in aquarium literature.

Let us now look at how the different areas of the tank are planted. There is a central unplanted area at the front which is used for feeding. Various species of *Sagittaria* and *Cryptocoryne* spent a brief time in the aquarium but are no more. Several bunches of *Selaginella* (Borneo Fern) likewise lasted only a short time in this tank. The permanent vegetation consists of several specimens of *Echinodorus tropica* at the front, then some plants of an *Echinodorus* species (the ones which are sold as *E. amazonicus* are often *E. bleberi*; moreover, these plants change their appearance according to the conditions in which they are cultivated, which makes it difficult to be certain of the species), some *E. 'Osiris'*, natural hybrids sold under the name *rubra*, and some *E. barthii*, called 'rubra double red'.

Some of these *Echinodorus*

Corydoras panda





are grown in pots and can thus be positioned on, rather than in, the substrate; this improves the overall

appearance of the aquarium, and the plants are thus closer to the light source, something which they

greatly appreciate. A jumble of large roots provides hiding places and also food for several Loricariids and

has been colonised by *Anubias* which have attached their roots to this handy substrate and clothe the

upper layers of the aquarium in green. Several large bunches of *Limnophila heterophila* fill the gaps at the rear and act as shelter for the Characins. Because of their rapid growth these last plants

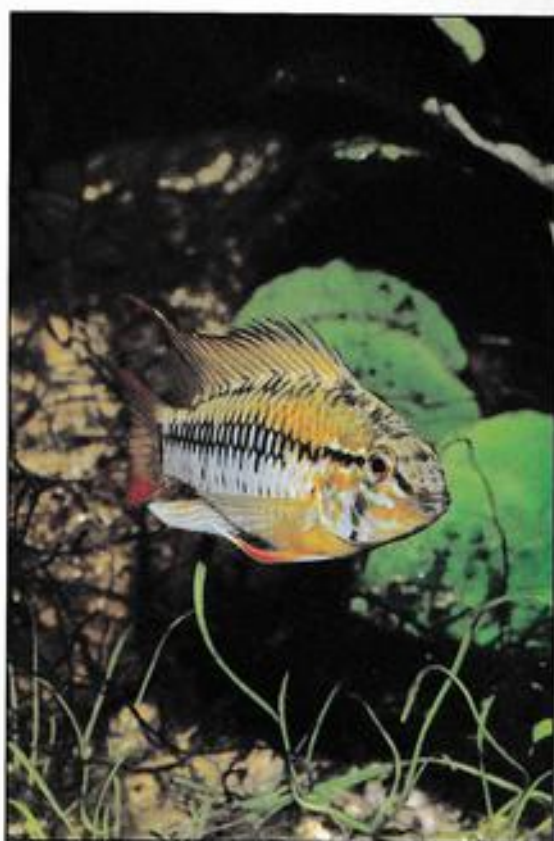


ABOVE
Amazon Swordplants,
Echinodorus sp., make excellent
decoration and spawning sites.

require a lot of attention needing to be pruned back frequently.

THE FISHES

An Amazonian tank without Cardinals (*Parachanna axelrodi*) is not an Amazonian tank! Our aquarium has more than 100 (about 120 to be precise!) These wild-caught fish were quarantined for about three weeks in an 80 litre tank. An aquarium with Cardinals but without Discus is still not an Amazonian tank ... so there are two Brown Discus; the first of these was given to us by a friend who was giving up fishkeeping and we felt obliged to give it a companion but we are not Discus freaks! Five Angelfish complete the bulk of the population. There are sometimes violent battles between the two males, with the dominance passing periodically from one to the other, depending on the preference of the females. No established pairs have been formed. Three other species of cichlids share the tank: *Pupiliichromis* (now *Microgeophagus*) *altipinnosa*, *Laetacara dorsigena* and *L. curviceps*; from time to time, a few *Apistogramma* complete the cichlid roll



ABOVE
Apistogramma rejita.

BELOW
Angelfish with spawn interrupted by *Laetacara curviceps*.





several days. We hope that this tale of our Amazonian aquarium will inspire some of our readers to paddle their own canoe. We can guarantee that they will not be condensing themselves to the galleys!

LEFT
Microgobius altipinnis.

BELOW
Veiltail Angelfish/Marbled Angelfish with gold head.

call.

The sea of Cardinals also contains eight *Hypheosbrycon* species of the *bentosi* group, several *Haemania nana* (Silver-tip Tetras) and some eight-year-old *Hypheosbrycon herbertaxelrodi*, the survivors of a tank of Brazilian fishes.

The Loricarids, a large family of catfishes, are represented by a *Leporacanthini galaxias* (with a strong tendency towards digging) and several members of the *Peckoltia* genus, *P. vittata*, *P. pulcher* and one as yet unidentified species.

When we first set up the aquarium, before we added the Aqualit, we had some *Callichthys* catfishes, *Corydoras panda* (which spawned on the front glass), *C. rasilus* and another *Corydoras* species scurrying around on the bottom but these are now housed in 250 litre tanks with a substrate of fine sand.

A total of about 160 fishes enliven our Amazonian tank. They are fed once or twice a day depending on our movements. They all enjoy red worms as well as frozen *Artemia* and *Tubifex* — and none of them turn their noses up at commercial freeze-dried foods.

Despite the water being vastly different to that of their original biotope some species have bred in this tank. The Angels spawn regularly but the eggs are eaten during the next hour, the 20 or so larger fishes participating in what is not so much a quiet meal as a gluttonous orgy. Overwhelmed by the repeated assaults of the *Laetacara* the pair of Angels are unable to do more than watch, powerless to intervene. On the other hand, both *Laetacara curviceps* and *L. dorsigera* have spawned several times and have succeeded in protecting their fry for





Breeding Kyburz Tetra

PART ONE

At first glance it's often hard to see the appeal of certain fish. A case in point is *Pseudochalorus kyburzi*; it is

PAUL BARROW DESCRIBES A
REAL PRECISION SPAWNER

PHOTOGRAPHS BY THE AUTHOR

bizarre dental work as evidence. Others may even mock its common name, Kyburz' Tetra, because it adds little to the mystique, lacking as it does the imagination that went into naming the similarly toothsome Bushy Mouth Tetra and a knowledge of rhyming slang. So why do I keep them? The answer is simple, because they are unusual, little-studied and have a very interesting approach to reproduction. In his book 'Characoids of the World' Jacques Gery' describes *Pseudochalorus* as an

not one of the world's most beautiful Characids, in fact, it has been described as downright ugly! Some would point to its lack of bright colours, its mournful expression and



ABOVE
Portrait of male showing the external teeth running down the maxillary bone.

RIGHT
Side view of male showing elongated dorsal fin and colour.



ancient genus, represented by four contemporary species, which can be traced back to the time of the Dinosaurs. Today's modern species have taken over the territory of *Pseudochaleus* and pushed all members of

each maxillary bone (the bones forming the upper lip). Why these fish possess such impressive external dental work is unclear; it is speculated that they are used for gripping large prey but, having said this, my fish

back fading through grey top an almost white belly. Males have a copper-coloured sheen over the top half of the body, a colour only seen in breeding females. A broad blue-black stripe runs through the eye,

individual and, probably, their place of origin. Natural daylight brings out the best colours when it suffuses the whole body with gold, blue and purple highlights. The fins are primarily clear with minor colouring details. The caudal, mentioned earlier, has a dark band flanked by coppery strips; the anal fin has a narrow white border and the adipose golden.

Sexing this Tetra is easy once they reach maturity because males tend to carry a noticeably longer and more pointed dorsal fin than do females of similar age. This elongation is not as dramatic or noticeable as, say, the Bleeding Heart Tetra's, but it is by far the most reliable method of sexing mature fish. Other methods can be used; for instance, the male grows slightly bigger, has a slightly larger anal fin and in the most colourful, but these are subjective and can be unreliable. Even gravid female do not betray their gender with rounded bellies because of the small numbers of eggs they produce.

Pseudochaleus kyburzi is one of many fish species that has an unwarranted reputation for aggression but despite their pugnacious appearance they are harmless, and do not attack other members of their community. The males do, however, become



ABOVE
Female in breeding colours.
Note short dorsal fin and
reduced number of spots.

BELOW RIGHT
Crenuchus spilota (male).

the genus to the outer fringes of the Amazon Basin leaving *Pseudochaleus kyburzi* restricted to parts of Colombia.

One extraordinary feature which sets this fish apart from others and aids identification is its teeth; these are not restricted to the inside of the mouth but also run in a single, saw-like row down the front edge of

have never shown any predatory tendencies towards other fish.

Kyburz' Tetra is an unremarkable species in other respects; growing to about 90mm and having no bright colours it is no match for its more spectacular and similar-sized cousins such as the Buenos Aires Tetra. The body is robust and high-backed, more reminiscent of an annual Killifish than a Tetra. Its large head, and downward-sloping mouth give it an angry, bulldog expression and adding to this sense of menace are the saw-like external teeth.

Both sexes share a similar colouration: the ground colour is light brown at the

forms an eye-spot at the caudal peduncle and carries on, at reduced intensity, through the tail. At the rear of the body, this band is flanked by coppery strips which also fade as they travel through the tail. Five or six horizontal rows of spots cover the body; these are variable in colour and can be blue, purple, brown or orange depending on the



Reference:
I. Gery, J. *Characoids of the World*. TFH Publications, 1977.



increasingly territorial with age and will guard their patch with a great deal of inoffensive bluff.

Their subtle colours blend well with their favoured haunt of the aquarium's shadier corners. They are a solitary, non-shoaling

and Java Moss clung to the wood. Filtration was taken care of by a custom-made undergravel filtered covered to a depth of 10cm by fine gravel. The high turnover powerhead which ran the filter created an overly-strong current, so the outlet

of comparable-sized Rasboras, Tetras, Cichlids and catfish, which lived in near-perfect harmony — or as near as it gets with territorial fishes!

Feeding presents no problems because they will eat any type of food. They

reluctance, they grow at a steady rate and can reach full size by the time they are eighteen months old.

The strange spawning pattern of this species shows some interesting adaptive behaviour which could be an intermediate stage



LEFT
Female mouthed male's vent. Pelvic and anal fins are bent around female's head.

BELOW
Male and female break apart as she releases a batch of eggs. A clump of three eggs can be seen leaving the female.

species which is an existence not uncommon amongst the more ancient characin lineages — the better known Sailfin Characin (*Grenulatus spilatus*) and the Blue Morpho (*Poecilocharax weitzmani*) being the prime examples.

Kyburz' Tetra is a hardy fish that is not too fussy about water chemistry in the aquarium set-up, but they are more settled in larger tanks with lots of hiding places. The tank in which these fish bred measured 84in long by 15in wide by 18in high and was decorated with lots of bogwood, cork bark and rocks. Plants were few and far between in this set-up, two or three Amazon Swords sprouted from between the rocks and small clumps of Java Fern

was turned into the aquarium's corner to disperse the flow. The rest of the community consisted

are hesitant to join in the feeding melee and tend to wait for scraps and titbits to drift their way. Despite this

between egg-scattering and substrate spawning. Despite the article's title, the fish bred in spite of my care (I





must be doing something right, for a trio of *Micoglossis* breed in the same tank a few weeks earlier — but that's another story). What caused these unusual occurrences can only be guessed at, but it may have been something to do with the upheaval caused by fitting a new undergravel filter system. When this was installed, the whole tank was stripped down and only one third of the original water retained. The original modest arrangement of bogwood was replaced with a rock and wood set-up that virtually covered the bottom of the aquarium, providing lots of nooks, crannies and shaded hiding areas. Unknowingly, during the rearrangement, I had positioned a piece of bogwood in such a way that it created the exact requirements for this Tetra's spawning to take place its flat face was at just the right angle to hold the falling eggs. In all probability, the introduction of a large amount of fresh water and the acidification caused by extra bogwood also helped to convince Kyburz Tetra it was time to breed. Water temperature in the spawning

tank was checked with an accurate thermometer and found to be 22°C — contrary to my liquid crystal stick-on's stated 28°C. The changes brought on by this upheaval replicated the natural conditions that exist during the rainy season. During this time, lots of humic acid is produced by decaying leaves from the forest floor, is washed into the rivers by vast amounts of cool rainwater. Most *Characins* tend to breed at this time because the increased volume of water gives their young a reduced chance of being found by predators and also an increased food supply.

Attracting the opposite sex creates problems for solitary characin species; male *Glandulocaudinae* for instance solve this by giving off an attractant from a gland in their tail to entice females from great distances. After watching the spawning antics of Kyburz Tetra, it seems as if a similar process goes on with this species. The prelude to spawning took place when the male chose the large piece of angled bogwood in the darkest corner of the tank. He constantly circled his

chosen site and at the same time must have produced some form of chemical signal to lure and excite the female. It was the female who initiated the spawning dance by shadowing the male's movements and nudging his back with her head. If the female found the male receptive to her advances she continued with this procedure, gradually working her way down his flank until she reached his vent. Once she reached his vent, she nuzzled it; meanwhile the male cupped his pelvic and anal fins around her head as if passing on some invisible substance. She stayed in this position for about 20 seconds, constantly mouthing at his vent and showing an increasing state of excitement by flickering her fins at an ever faster rate. The male used the female's distraction to manoeuvre her into position over the flat spawning site by bending his body towards her and gently pushing her closer to the bogwood until they almost touched it. After a final frenzy of fin-twitching, she spread her ventral fins and released four or five eggs as she and the male broke away

in different direction. The eggs, because of the short distance they fell, landed on the flat surface of the bogwood. This behaviour ensured that the eggs were closely-grouped and not scattered over a wide area. At this point, the male chased the female into a far corner of the tank and returned to the eggs. He then made two or three tail-slapping passes over the newly-laid eggs to break up any clumps and to spread them evenly. Most of the eggs stuck to the wood, any that fell to the gravel were eaten by the male. This cycle of attraction, egg-laying and chasing lasted for many hours, and by the time it was over the female's fins were tattered and torn. It was impossible to tell when the eggs were fertilised as this could have taken place when the eggs were laid or when the male made the tail-slapping passes over them. My guess would be the latter as when the female laid the eggs the male's vent was not close enough to her oviduct to ensure that any of the eggs would be fertilised.

TO BE CONTINUED



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FROGS & Friends

By BOB and VAL DAVIES



HERP FACT FILE

Feeding Green Iguanas

One of the main problems encountered with keeping baby Green Iguanas, which are imported in substantial numbers, is the provision of an adequate diet. Many books advise using insects and dog/cat foods, however, a recent study of wild specimens found no insects, only plant material, in the gut of the baby specimens examined. Some babies will readily take insects and others will refuse them. If they are taken then there is no harm in using some as part of the diet but an adequate amount of suitable plant food must be provided also.

Cat/dog foods are not now generally recommended — they are high in protein, fat and added vitamins and minerals.

Unnatural foods such as cottage cheese and other human foods should NOT be used.

Food should be chopped into small pieces and mixed thoroughly so that the creature does not eat just one ingredient. Iguanas need a varied diet and adequate supplies of calcium to build healthy bones (one of the main problems with captive specimens).

Vitamin D3 is needed to utilise the calcium. Normally synthesised by the action of sunlight, D3 will have to be provided by a multivitamin supplement. NB: Too much vitamin D3 is as dangerous as too little — if the diet is deficient in calcium it is leached from the bones by the vitamin. Full-spectrum light is recommended to assist synthesis of



Baby Green Iguanas — diet is all-important.

PHOTO: BOB & VAL DAVIES

vitamin D3 — specially developed 'Iguana Lights' are now available in some reptile outlets.

Whilst there is still some controversy over suitable diets it is widely accepted that it should contain roughly 15 per cent maximum plant (not animal) protein, 85 per cent minimum plant material for specimens up to 2 1/2-3 years. Adults need only 5 per cent maximum protein. Fresh peas and beans contain protein and a high vitamin content. Other pulses and alfalfa seed can be sprouted before use. In addition, try a wide variety of vegetables and fruits including less well-known varieties, eg. kale, endive, parsley, lambs tongue lettuce, dandelions, red clover, nasturtium flowers and leaves, rose petals, frise lettuce, romaine lettuce, watercress, salad and mustard cress. More common vegetables such as carrots, broccoli and cabbage are useful as are fruits such as strawberries, raspberries, black- and red-currants, and figs. Lesser amounts of apples, melons, plums, peaches, pears, grapes, tomatoes and kiwi fruits can be provided. Hard foods such as carrots and apples should be shredded first.

Our specimens will eat almost anything if tiny pieces of tinned mango

is mixed in — some iguanas can become hooked on one particular food, which leads to dietary deficiencies. Certain foods are said to bind calcium and iodine which robs the iguana of the benefits — the former include spinach and beets (they contain oxalates), the latter cabbage, broccoli, cauliflower, kale and brussel sprouts — these should be fed in moderation. Powdered cuttlefish bone or a calcium supplement should be sprinkled on the food.

Drugs and the wildlife trade

The ingenuity of drug-smugglers seems to know no bounds — they are constantly seeking new and unusual ways of concealing their contraband — the more unusual the more likely they will use it. According to reports from the USA the wildlife trade is frequently used for narcotics smuggling: cocaine hidden in boxes of venomous snakes in the hope that they will

not be too closely inspected is a frequent ploy. In another case condoms filled with cocaine had been forced, via the cloaca (vent), into live Boa Constrictors (41 boxes of them from Colombia). The cloaca had then been stitched. Under surveillance the cargo was allowed to be moved. Agents kept watch in blistering temperatures but the van was not collected — when finally opened 202 of the 312 unfortunate snakes were found to have died.

A similar method using large Goldfish was discovered — in another case bags of fish were

inside another bag containing liquid cocaine, dyed to match the medicated water in the fish bags. Even racehorses, crossing the border from Mexico to the USA have been used and another common method is to include some dead birds containing drugs in live bird consignments.

The cases discovered are but the tip of the iceberg (estimated at 0.1 per cent of total violations) — the huge numbers of tropical fish and other wildlife consignments passing through Miami daily make it impossible to check every one — only a handful

of officials exist for inspection. The Bureaucratic red tape — paperwork predominating over actual inspection, is also blamed. Other countries are not immune, the problem is worldwide — according to reports valuable reptiles and birds are smuggled out of Australia in exchange for drugs from the USA and Asia. The scale of the problem is obvious when one realises that the US Fish and Wildlife Service actually seized a total value of over \$26 million in 1993, how much went undetected is anyone's guess.

Swimming in the sand

For many years the Sandfish (*Scincus scincus*) has been a popular vivarium subject often featuring on dealers' lists and many older books had a section on this attractive lizard's care in captivity. They are often available and their relative ease of maintenance makes them easy to cater for. As they are livebearers they are also easy to breed and at today's prices they are not usually expensive.

The natural habitat of Sandfish is arid, sandy areas from North Africa to Iran. Sandfish are fairly typical Skinks — heavy, cylindrical bodies and short tails, the scales are polished making them difficult to grasp. At the first hint of danger they disappear, burrowing into the sand and moving away so rapidly they appear to 'swim' through the loose substrate, hence their common name. (Some other species of sand-dweller are sometimes labelled 'Sandfish'). The chisel-shaped snout is a further adaptation to their mode of life.

Requirements in the vivarium are fairly simple; a sandy substrate at least 3in (8cm) deep — bird-sand with or without oystershell grit is suitable (do not use ordinary builders' sand which becomes dusty and compacted). A rock or piece of cork bark for basking can be provided, the former must be bedded firmly on the vivarium base to prevent it sinking on the animals when they burrow. Sandfish may be wary when first obtained and will disappear when approached but soon become accustomed to the keeper and will remain basking under the heat source. A hot spot (provided by a spot lamp) of up to 90°F (32°C) is suitable. Night-time temperature can drop to 60°F (15°C).

Full-spectrum fluorescent light is recommended for these desert-dwellers. The photoperiod is 12-14 hours. Food consists of the usual insect fare dusted with a multivitamin/calcium supplement, and extra calcium can be provided by supplying small pieces of cuttlefish bone. A light daily spray is usually adequate — a very small water bowl, resting on a stone to avoid upset, can be provided but is not really necessary as they seldom drink.

An eventual total length of 8in (20 cm) is reached. If attempting to breed them, a winter cooling of 4-6 weeks at 48-50°F (9-10°C) is advisable.



Sandfish basking — note the chisel-shaped snout and polished scales.

PHOTO: BOB & VAL DAVIES

Declining amphibians

The worldwide decline of many amphibian species is causing concern among scientists, and various projects are in operation to investigate the causes. In some cases the decline is due to obvious human influences such as deforestation, drainage, chemical pollution, introduced species and the like. One example is the Tiger Salamander (*Ambystoma tigrinum*) whose populations at 11,000ft in the Rocky Mountains of Colorado are affected by sulphuric acid and nitric acid carried to their habitat from coal-burning power stations. The acids accumulate in snow over the winter. The Spring thaw, when the Salamanders breed, brings a sudden increase in acidity to which the animals are extremely sensitive.

Long term studies frequently show natural population fluctuations due to drought and other natural phenomena, with numbers recovering after one or more bad years. However the evidence would seem to be pointing to other global factors. In many cases the decline (in some cases extinction), is occurring in protected or isolated areas of pristine habitat. In Puerto Rico three of the 18 amphibian species are probably extinct, six are apparently stable, the others are declining. One possible reason is that fog brings in chemical contaminants. The affected species (here as in some other cases) mainly live at high altitudes and tend to show ecological specialisation. Re-colonisation after a wipe-out is difficult (even impossible) in the case of isolated populations — interconnecting corridors would be necessary for this to occur. Similar declines are being recorded in many other countries. Amphibians, because of their sensitive skin, which in many species is permeable, are possibly more readily affected than many other creatures and are regarded as bio-indicators of the general health of our planet, i.e. they are a natural early warning system.



Tiger Salamander — natural habitat under threat from pollution.

PHOTO: BOB & VAL DAVIES

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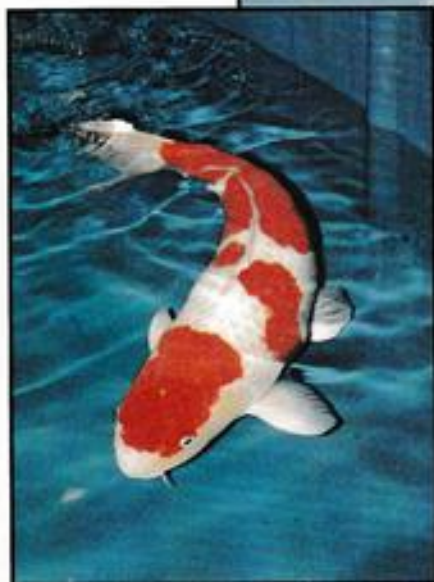
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Happy New Year everyone! I hope that readers will have enjoyed their Christmas and received many Koi-related presents.

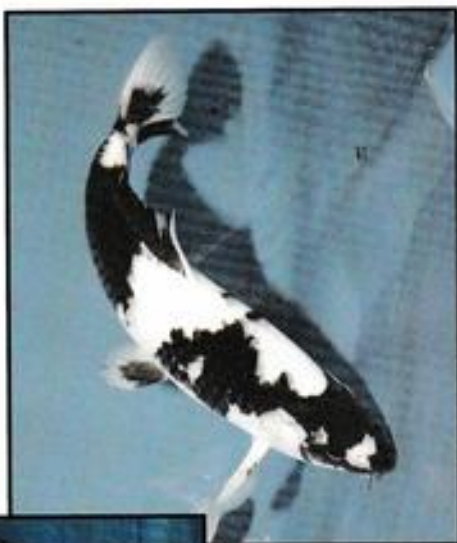
At time of writing this column the weather outside my study window is horrendous: snow, snow and more snow that should be saved for Christmas Day. I have, as yet, not fixed up covers for my new pond and am therefore seeing the water temperature pulled down to the point where my 6KW heater is unable to hold (using Economy 7 hours only) the 12°C that I require. The temperature this morning had dropped to 10.4°C and I am hoping that it will drop no further.

Should the temperature fall below 10°C then I shall cease feeding and that is something that I do not like to do until the end of the year. Even if the temperature were to turn mild after feeding has stopped it would be unwise for me to start feeding again for fear of partly digested food remaining in the gut. In the 'wild' or in natural ponds carp will grub around amongst plants to find the right type of food for their requirement at that time and under those prevailing

It's easy to appreciate lovely Koi like these, seen recently at the South of England (ZNA) Koi Club Show.
PHOTOS: DAVID TWIGG



DAVID TWIGG'S **KOI** CALENDAR



conditions. We Koi keepers cannot, unfortunately, give our pets that sort of a home and must therefore be cautious in our approach to feeding at low temperatures. Please take note of any feeding instructions given on the packet of

food fed.

At this relatively quiet time of the Koi year the Clubs around the country turn to speakers for advancement of knowledge and one of the popular topics is 'appreciation'. As I have said many times before our appreciation of these wonderful fish improves with time and a Koi we may have admired a few years ago will not now be given a second glance.

The reasons for our improving 'appreciation' are many, but mainly because of our natural thirst for deeper knowledge of our hobby. We undertake regular observation of our own and our friends' existing collections as well as rushing to view the newly-imported stock in the dealers' tanks. Club speakers are another important part of the learning process. They can often clarify the finer points under discussion, with the aid of slides or diagrams, much more easily than can be expressed in the pages of a book.

I hope that by the time the new Show season gets underway we will be more able to look into those Show Vats with a more 'appreciative' eye. I look forward to seeing you there.

Unfortunately I have only received three notifications of meetings this month. I would request Club Secretaries to fax

me their 1997 diaries at their earliest convenience on 01926 403500. Thank you.

Koi Meetings in January

8 South Hants Section

BKKS. Speaker is Ron Parlour. Meet in Denmead Church Hall. 8pm. Contact George Rooney on 01420 473169.

8 Leicestershire Section

BKKS. Monthly meeting. Contact Mick Reffin, 0116 2712517.

12 Heart Of England Koi

Society. Speakers are Kevin Jackson and Lloyd Bartley. Meet near Dunchurch. Contact me on 01926 495213.

Koi Shows in 1997

MAY

10/11 Norwich Section

BKKS. 1st Open Show at The Royal Norfolk Showground, Nr. Norwich. Further details contact Glyn Bowman on 01328 851695.

31 May/1 June UKoi '97. Haydock Park Racecourse, Cheshire.

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

Out & About

Supreme Festival of Fishkeeping 1996

**LINDA
LEWIS**

REPORTS ON
THE ANNUAL
EVENT KNOWN
SIMPLY AS
'WESTON'

PHOTOGRAPHS BY
THE AUTHOR



The winners and supporters,
Junior Fish Show.

There were some uninvited guests at Sand Bay, Weston Super Mare — gremlins! They did their utmost to try and upset things. They made projectors blow up, video recorders eat tapes and the occasional event run late! Yet, despite their efforts,

people still managed to have fun.

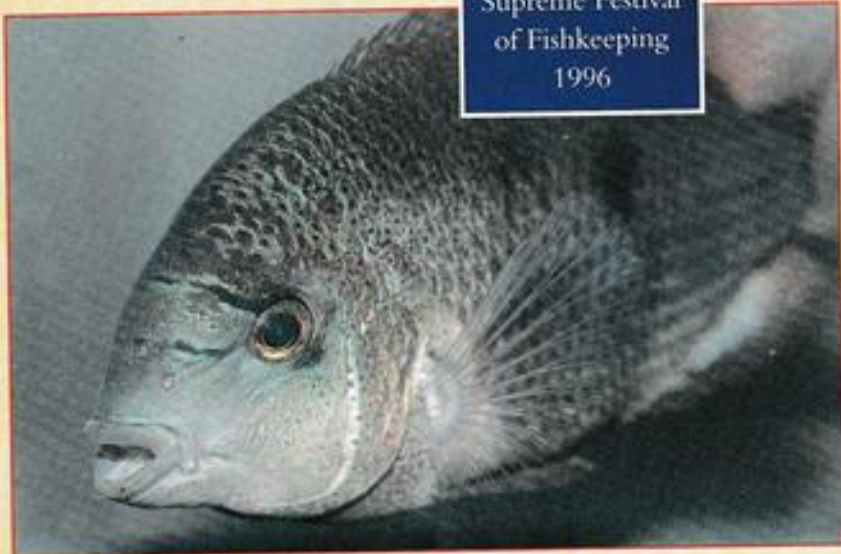
This was the second time that the weekend, organised by the Federation of British Aquatic Societies, has been sponsored by Rolf C. Hagen (UK). Visitors stayed the weekend for the bargain price of £65 which included comfortable accommodation, breakfast

on Saturday and Sunday, plus a celebration meal on Saturday evening. Not bad value at all, but you also got a Hagen voucher to the value of £15. Deciding what to spend it on took ages; there was so much choice on their excellently-stocked Stand!

I spent a few hours in the local Sea Life Centre before

catching a cab to Sand Bay. When I arrived the camp was electric with activity. Day visitors only get to see the finished result but arriving on Friday lets you see some of the work involved in putting everything together but, in truth, preparations take months and I would like to say 'thank you' to everyone

Supreme Festival
of Fishkeeping
1996



LEFT
Supreme Champion, *Herichthys regani*.

MIDDLE
Junior Fish Show, Best Fish,
North American Darter,
Etheostoma caeruleum.

BELOW
Open Show, Best Fish, female
'oddball' livebearer, *Carliniabola maui*.

involved in this hard work, not least the ever-present Joe Nethersell and the team of willing helpers from the Hounslow and District Aquarists Society.

Friday evening was spent settling in, and meeting up with old friends, before retiring to the main ballroom for the entertainment. As usual there was a Fancy Dress, with very worthwhile prizes — Hagen offered a £45 token for first prize, £30 for second and £15 for third in the adult's contest. There were only three entries which was a shame, but I am sure that if similar prizes are offered next year we will see dozens of entries!

Saturday, 10.00am, and the Festival officially opened to Day Visitors. Dozens of children began to bench their fish for a new event — the Junior Fish Show. A choice of lectures were on offer, including one by Peter Anderson especially for the youngsters. I caught Bill Rundle's on Aquatic Plants and was pleased that he included a good slice of botany, as well as more



general information. Just as he was nearing the end of his presentation, the gremlin struck! Smoke poured from the projector! It was just as well that Bill had almost finished.

An item in the programme had caught my eye. Seascale Junior Fishkeeping Society had made a video entitled 'Fishkeeping As We See It', which was due to be shown



Supreme Festival
of Fishkeeping
1996

on Friday evening but was postponed (due to gremlins) until Sunday. The Seascale Club is very unusual in that it is for Juniors only. Adults help to run it but are not part of the membership. Everyone was very impressed by their efforts at the Festival last year, and this year they seemed determined to do even better (more later).

Saturday afternoon brought the semi-final of the Interpret Fishkeeping Challenge. If you saw the entry questions published in *A&P* then you will realise the standard of this competition. I am supposed to know a lot about fish, but those questions had me stumped! The contenders had to write down their answers to 15 five-part questions, some of which were really nasty — could you name five of Dick Mills' books? (No — Ed!) This marathon brought the numbers down to two, who competed in Sunday's Final, the eventual winner being Alan Stevens of Eastleigh A.S. who triumphed after a hotly-contested round over David Marshall of Ryedale A.S.

The afternoon's main lecture was meant to be on Water Quality and Filtration by Alan Benson, but the gremlins switched it so I found myself listening to Les Holliday on Marine

Aquariums instead. I'm strictly a freshwater fishkeeper and having seen the amount of technology involved in the marine side will likely stay that way! I did, however, enjoy seeing the pictures of fish.

An event that has already, on just its second showing, become a highlight of the weekend is the Geoff Capes' Tug O' War.

The noise when this is taking place has to be heard to be believed, as all kinds of people cheerfully volunteer to nearly kill themselves, just to get a prize! I didn't catch the entire competition but managed to see the Seascale Glow-worms win the Junior section.

I had spent too long over at the Junior Fish Show in which there were 99 entries. I am no Judge, but I felt sure that some of the fish in this Show would do well in the main competition too.

The winning fish was a North American Darter, *Etheostoma caeruleum*, a really beautiful example, owned by Luke Powell of Erith and District Aquatic Society. Luke was presented with his

Trophy by the Managing Director of Hagen, Mr Andrew Bartyla. The highest pointed individual was Robert O'Grady from Swarsea, just a dip of a lad. His Club also scored the most points, even though he was the only one



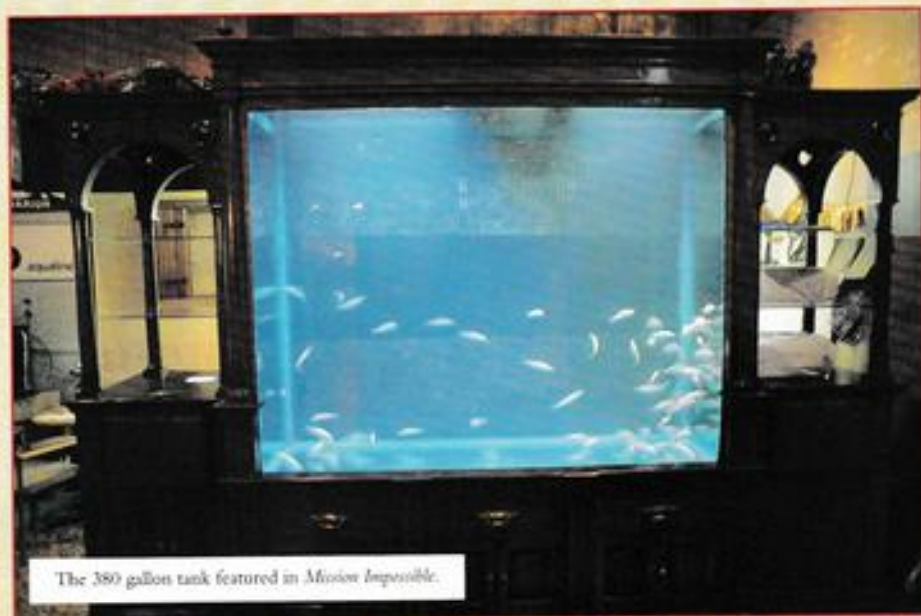
TOP OF PAGE

Plenty, too, for herpetile fans like this Tomato Frog.

ABOVE

Chance to see unusual fish at close hand, Marbled Lung Fish, *Protopoma aethiopicum*.

Supreme Festival
of Fishkeeping
1996



The 380 gallon tank featured in *Mission Impossible*.

exhibiting!

Every junior who gained a fourth place and upwards was presented not only with a Certificate and Trophy (supplied by Bullseye Trophy Centres), but also a bag of goodies (T shirt, food, etc), and for each place obtained was given a small Show Tank. This meant that some entrants needed a large box to carry away all they had won (I only hope their parents had left enough room in their cars to take the extra luggage!) So, thanks to Hagen's generosity, and the enthusiasm of the Juniors, this was a very successful event that must surely be repeated next year.

Saturday evening brought the Celebration Dinner. No complaints there except, what happened to the Christmas Pud? The gremlins were about though. They had fiddled with the thermostat so that the room felt like a sauna. Speeches

were kept short and several aquarists were presented with Gold, Silver and Bronze FBAS Brooches. Bouquets were presented to Jackie, of Jackie's Juniors fame, and Grace Nethersell, who had organised all the bookings and accommodation arrangements.

Later that evening it was time for the children to show us what Fancy Dress is really about. There were 19 entries, and every one was a possible winner, with some really imaginative ideas. The popular winners came dressed as Perdita and Pongo from 101 Dalmatians, complete with a buggy containing pups. Bullseye Trophy Centres supplied prizes for all the entrants, which was only fair as they gave us such marvellous entertainment. I felt particularly for the girl from Seascale who came as a Jelly-fish. Completely buried in a costume of bubble

wrap, she must have been melting in the heat!

Sunday, and the entries begin to arrive for the Hagen Masters' Open Show, and the 1996 FBAS Supreme Championship. In all there were 525 entries for the Open Show, and 43 in the Supreme — a huge entry and all good quality fish. Judging is a very serious business so I kept well out of the way!

Shortly after 10.00am came an announcement that the Seascale Video was being put on. Alas, the gremlins struck again. For 20 minutes various video recorders were tried but all we got to see was about five minutes of the tape, with virtually no picture quality at all. The biggest shame was that the children from Seascale, who had worked so hard to produce it, had not been allowed to see it yet! In the end I missed seeing it, although I think it was finally presented later in

the afternoon. If it's possible, please can we have a chance to view it next year?

However, there was a happy ending for these Juniors, as later in the day they presented a live, on-stage 'drama' related to conservation, a subject also illustrated (using fancy Dress) in a special junior participation event created by Bristol Zoo.

I cannot resist quoting the announcement that came over for the 10.30 lecture by Colin Grist of Bristol Zoo: for those who didn't know who he was, the announcement described him as 'a Huggy-bear with a beard', a perfectly wonderful description, and one that I will never let Colin forget! His talk, about how the aquarium had developed, showed the aquarium under construction, how the tanks were lit, and the various problems that had been met and overcome, before coming to the topic of



THE TWILIGHT ZONE

DEREK LAMBERT SEARCHES THE WORLD FOR
SPECTACULAR LIVEBEARERS



The Red-tailed Catfish.

PHOTO: GORDON WIGENS

Searching the world for new and rare livebearers one comes across other fish which I make a note of and release. One of the most spectacular of these was a huge catfish which I found swimming around at twilight in Lake Bacalar, Mexico. At the time I was using 'Aquarian' flake food to entice fish into a shallow inlet so that I could catch them. Suddenly all the livebearers and cichlids

interesting catfish are found throughout much of the sub-tropical areas of the Americas and just about everywhere in the tropical regions. They are known as Naked Catfish because they don't have scales or bony plates to protect their bodies. Most species have three pairs of long barbels and a very large extended adipose fin.

The family contains very few well known aquarium fish despite coming from

normal aquarists' tanks, yet it is still sold to unsuspecting hobbyists.

One of the best species of this family for aquatic life is *Pimelodus pictus*. This species has the rather misleading common name of Angelicus pimelodus. This name was given to it because it was originally imported to the USA in 1968 under the fictitious name of *Pimelodella angelicus* but the common name stuck and is still seen in aquarium literature. In

greater or lesser extent, this one will swim out and about during the evening. The rest of the day it likes to hide in caves and behind filter uplifts. Coming from a soft water area it prefers soft, acidic water but will adapt to hard water conditions if that is all you have. It must, however, have clean, clear water which is well filtered if it is to do well in captivity.

Its dietary requirements are easily filled by flake,



Acanthodoras cataphractus.

PHOTO: MP & C. PHENNER.

swam off and in came a huge catfish swimming upside down. Its huge mouth was skimming off food from the water's surface and although I never saw any sign of it trying to catch fish its mouth and the behaviour of the other fish certainly indicated it might be a predator.

This was my first introduction in the wild to the family Pimelodidae — the Naked Catfish. These

many areas where fish are collected for the aquarium hobby. The reason for this is the lack of information on many species (it is not even known for sure how many of them breed) and the size others achieve. One of the big beasts of the aquatic world belongs to this family. The Redtail Catfish (*Piaractus brachipomus*) grows to in excess of 4ft in captivity and is totally unsuitable for

colour it is a silver fish with black blotches over much of the body and fins. The whiskers are particularly long and held well clear of the body much of the time. Since it grows to only 4 1/2 in in the aquarium and can safely be kept with even quite small fish it makes a good community fish for those who want something a little different.

Whilst most species in this family are nocturnal to a

frozen, granulated, tablet and freeze dried commercial foods plus the odd feed of a suitable live food such as Blood Worms. One thing to watch out for when you have to catch this species is the hard and very sharp pectoral fin rays. When trapped in a net these become completely entangled and only cutting the net away will free them. It is also all too easy to be stabbed by these spines.



when handling them, so always use a plastic or glass container to trap the fish in.

Another suitable species is *Pimelodella gracilis* — the Slender Pimelodella. This is one of the few odd-ball catfish which I have at the moment, 'inherited' from a friend when she gave up fishkeeping over six years ago. It was a full grown animal of some 7in then and has continued to grow ever since.

.....
This one spends just about all day hiding at the back of the tank and only comes out to feed during the night. Apparently it will come out in the evening if the tank is dimly lit but I have never seen mine do this. One problem with this species is its tendency to 'hoover' up small fish as they sleep on the bottom of a tank. Since this happens at night the aquarist is none-the-wiser and usually can't understand where his Neons have gone! For this reason I never keep anything smaller than 3in in the same tank as my slender Pimelodella.

.....
One of my favourite Pims which I used to keep a long time ago and really want for my current community tank is *Microglanis iberoi* — the South American Bumblebee Catfish. This is a lovely addition to any community tank, although being sensitive to nitrites the water quality has to be carefully maintained. It only grows to about 2 1/2in and feeds on just about anything, although they go crazy for small chopped Earthworms.

.....
Once again this is a nocturnal species which you are unlikely to see very often but it can be trained to come out in the evening and

feed at the front of the tank. To see this put its favourite foods in the same place in the tank at the same time of the evening. Then carefully sit back and wait. Slowly it will become accustomed to this routine and start to come out. Put some food in the other end of the tank just before you feed your Bumblebee. This keeps the other fish occupied.

.....
As I am primarily a livebearer specialist Catfish have rarely held more than a passing interest for me. They are good scavengers and fill a niche in the aquarium which would otherwise be empty. There are, however, some catfish which are least part way to becoming livebearers and according to some scientists these fish are actually livebearers. These are the Driftwood Catfish belonging to the family Auchenipteridae. What is so remarkable about these catfish is that the male has a modified anal fin which is used to fertilise the female internally. Later eggs are deposited without the presence of the male.

.....
Now to most aquarists these are obviously 'Egglayers' but scientists use a different set of criteria when defining 'Livebearing'. The main scientific criteria for this is internal fertilisation, not the fact a fish later goes on to produce fertilised eggs. A guppies' eggs are internally fertilised and then held on to by the female until they are just about to hatch, at which point they are expelled and the baby is 'born'.

.....
These Catfish do not hold on to the egg as long, so it still has some developing to do after it has been expelled, but otherwise the two fish

are breeding in exactly the same way.

.....
Not many of the Driftwood Catfish are imported on a regular basis but if you can find them *Auchenipterichthys longimanus* — the Spotted Woodcat, *Auchenipterichthys thoracatus* — the Midnight Catfish and *Trachelyopterichthys taenians* — the Striped Woodcat are some of the best to look out for. All grow to a maximum of 6in and are nocturnal but can be tempted out during the twilight hours with live foods and other tit bits.

.....
They need a cave or two to hide in during the day and make sure there is plenty of plant cover in the tank as well. They come from soft acidic water but will adapt to moderately hard and slightly alkaline conditions. Once again you should be a little wary of what you keep them with as they will eat small fish up to about 2in long and never use a net to catch them in as their spines will stick fast in it. Use a glass or plastic container to catch them in.

.....
They will eat all foods but are basically carnivores which need meat, fish and live foods in their diet. A good quality flake food can form the basis of their diet but this should be supplemented with feeds of beef heart, pieces of fish and live foods. Although the method of reproduction is known few people have ever managed to breed these fish in captivity.

.....
Another interesting South American catfish family is Doradidae — Thorny, Talking or Spined Catfish, so called because of the tough bony plates and spines on the head and sides. The very hard front rays of both

the dorsal and pectoral fins can be locked open when the fish feels threatened. These jam into a net or hand with devastating consequences and have been known to cause the death of predators such as crocodiles when they lock open and lodge in the throat. Included in this group are the Talking Catfish. These use their spines to generate a rasping sound which can be heard from the other side of a room. This strange behaviour seems to be triggered when the fish feels threatened, but it may also be used to attract a mate.

.....
Quite a few species have been imported but some of the commonest are *Platydoras costatus* — the Chocolate Dorid, *Agamyxis pectinifrons* — the Talking Catfish and *Acanthodoras cataphractus*. These grow to between 5in and 9in and are totally nocturnal when first introduced to an aquarium. Eventually they will venture out during the evening but only once they feel completely safe in their new home. They eat all foods and are not prone to making a meal of even small tank mates. Some species like to dig into the gravel during daylight hours and all need a cave to retire to.

.....
There are other interesting groups of South America Catfish but I have run out of space in this article so they will have to be left for another time. I hope I have opened your eyes to these fascinating fish, so that when considering catfish for your aquarium you think beyond Corydoras and Loricariidae to some of the other creatures living in the twilight zone.

TROPICAL



WILD DISCUS

BRIAN MIDDLETON
PROVIDES AN INSIGHT
INTO THEIR HABITAT

PHOTOGRAPH BY THE AUTHOR

The Amazon drains over seven million square kilometres which makes it, by far, the largest river system on Earth. An annual average of 200,000 square cubic metres a second of water flows into the Atlantic which is one-sixth of the world's total discharge to all the seas. During its 6,400km passage from Peru to its mouth in the Atlantic it takes in over 1,100 tributaries of which 15 are larger than the Rhine in Germany. In the north, this river system is connected with the Orinoco and in the south it is connected with the Rio de la Plata through a system of swamps and lakes that form a network larger than can be imagined.

The Amazon originates in

the Andes mountains where it is called the Rio Marañon; then, after it leaves the mountains its name changes to the Rio Solimoes. It is not until it reaches the Rio Negro (Blackwater) in the region of Manaus that it becomes the Rio Amazonas.

THE AMAZON'S MAIN INDUSTRY

Commercially important a large number of well known aquarium fish (approximately 20,000,000 with a value of 1,000,000 American Dollars are exported annually from the Amazon Basin according to official statistics. It is quite probable that the figures are much higher than this. The Cardinal Tetra is among the most important species accounting for 80 per cent

numerically and 50 per cent in dollar value of the exports. This is followed by the Neon Tetra and then the Discus. While the first two species come from areas of small, clear water tributaries of the middle Rio Negro, the Discus, however, primarily come from the flooded areas of white water. The areas of Manacapuru and Tefe are amongst the most important capture areas.

The annual rainfall in these tropical waters creates the flooding cycle that has such an important effect on the water chemistry. Due to their uniformity the length of day and night have very little effect on the ecology.

Not all of the rivers of Amazonia are muddy. Turbid waters that are very high in suspended solids, such as the Amazon or the

Rio Madeira, have a visibility that can be less than 18in. In contrast, the waters of the Rio Tapajos, for example, is absolutely crystal clear whilst other rivers such as the Rio Negro are the so-called blackwater rivers, recognisable by their coffee-brown colour.

The rivers that are high in suspended solids have their origins in the Andes where they take on sediment from erosion; they then transport these solids to their mouth. Among these are the Rio Madeira, the Rio Solimoes and the tributaries the Rio Purus and the Rio Juruá. The crystal clear rivers originate in central Brazil, among these are the Rio Tapajos and the Rio Xingu.

The rivers, such as the Rio Negro, which are blackwater rivers, are deficient in suspended solids

TROPICAL Wild Discus

but have acquired their colour from the humic substances that the water releases from a thick layer of raw humus and dead plants. Vegetation and soil formation are extremely important factors in the formation of the Amazonian river types.

WATER CHEMISTRY OF THE AMAZONIAN RIVER SYSTEM

The different origins of the types of water can also be seen in their chemical composition. Something that they all have in common is an extremely low nutrient content. The sediment-carrying white water tributaries in the Amazon Basin have the highest nutrient content with a conductivity of 60 micro-siemens and a pH between 6.4 and 6.9. The visibility is only around 12in due to the high content of dissolved solids. The black waters with their conductivity of 5-10 micro-siemens have the lowest amount of dissolved salts. The pH values are extremely acidic and vary between 4.5 and 4.8, and in some cases as low as 3.71. These are, however, very hostile conditions for Discus.

The clear waters with a visibility of 15ft vary greatly with respect to their nutrient content. Some areas of the central Amazon are extremely deficient in nutrients and decidedly acidic with pH values as low as 4.5, whereas in other areas the waters are less acidic with pH values between 5.5 and 6.6. The clear waters represent a transition between the white and black waters.

KEEPING WILD DISCUS

The keeping of wild

Discus is, as far as I am concerned, the epitome of freshwater fishkeeping. It is extremely rewarding, and whilst a few Discus keepers claim to have bred wild Discus very few have actually raised them successfully as the amount of wild offspring available for purchase shows.

The first requirement a prospective wild Discus keeper needs is an overdose of patience as wild Discus take anything up to a year or more to settle down in a domestic situation.

The next most important thing is to make sure, to the best of one's ability, that the wild fish have come from a reputable source. They should be purchased from a supplier that is used to dealing with wild-caught Discus, as it is extremely important that they have not been indiscriminately treated with antibiotics as this can affect their immunity to disease as well as rendering them sterile. Another extremely important criteria is that they should have been quarantined in a proper manner, as the less you have to treat a wild fish the better.

Wild Discus are extremely sensitive to water quality and a considerable amount of care should be taken over this. Before buying wild fish you should ensure that fish you are purchasing are feeding well.

When Discus are caught they are transported in half oil drums as containers and at this time they are given many water changes but no food. When they reach the exporters they are put into holding tanks and are fed a very basic pelleted food. The Discus then get flown to the wholesalers and put into his tanks to be quarantined, and nursed

back to health, if they are lucky. The Discus is then disturbed once again and sent to the person that is going to sell it to you. By now, you will begin to realise the incredible amount of stress the fish is exposed to.

As I have stated many times in my articles stress is the one main reason Discus become unwell so the importance of purchasing young wild Discus from someone experienced with wild fish is strongly advised.

BUYING WILD DISCUS

I have mentioned this in a previous article but I will mention it again as it is a question I am repeatedly asked and that is why do so wild Discus never look like the photographs in the book. The reason is that for every 1,000 Discus that are caught in the wild there are only six or seven of these that are truly magnificent in their shape and colouration. The rest are just run of the mill fish that are fairly plain and basic. The half a dozen or so exceptional fish are sorted out from the rest and are sold by the shippers as 'Special'. These fish can, and do, command an extremely high price and I am afraid the UK has, up until now, been the 'dustbin' for the wild fish.

With a very few exceptions the wild that are seen over here for sale are, quite frankly, mediocre to say the least. I am lucky enough to know a Discus fisherman and I now purchase my wild fish directly from him. The quality is superb, but the prices are high. The reason for the high price is very simple — the main market

for these exceptional fish is Asia. The Asians are quite prepared to pay high prices for their breeding stock, and the only way to obtain stock of equal quality in the UK is to pay the same price as the Asians are prepared to do.

The exciting thing about wild Discus at the moment is the new forms that are being found due to new waters being discovered as transport is able to go further to fish. There are now no less than six different forms of wild Heckel, the most beautiful of these being the Blue-headed Heckel.

People often ask me whatever happened to the Brown Discus? It still exists but there are now more than 20 different forms, some of the most beautiful (and costly) are those from the Rio Madeira and the Rio Ica; these fish are as near pure red as you can get.

I now go and pick all of my wild Discus personally and I am lucky enough to have some extremely fine and rare Discus and over the next few months as they settle down I will photograph them and hopefully publish them for you.

FEEDING WILD DISCUS

The feeding of wild Discus is different, although no more difficult than feeding domesticated fish. The diet should consist of live Whiteworm, frozen Bloodworm, Glassworm, Mosquito larvae, Mysis Shrimp and Earthworms. Meat is also important and I also feed Beeheart and Diskus.

**NEXT MONTH I
WILL EXPLAIN IN
DETAIL HOW TO SET
UP A TANK FOR
WILD FISH AND
EXPLAIN A NUMBER
OF THE VARIETIES
NOW AVAILABLE**

Let There Be Light! (1)

Interpet, one of the world's leading suppliers of fluorescent aquarium lighting, has introduced another technological breakthrough by adding a catalytic pellet into their lamps. The solid state zinc alloy catalyst delivers even better, more consistent, performance from Interpet's high specification lighting range. The other major spin-off of the solid state catalyst is that it makes these fluorescent lamps the most environmentally-friendly on the market.

Adrian Exell, Interpet Brand Manager, explains: 'Our close relationship with the lighting giant GE ensures that we are able to bring all the advantages of the very latest advances in lighting technology to the aquarium keeper. You can tell very easily if a tube contains the new catalytic pellet, because it rattles when you shake it!' reveals Mr Exell.

The new technology will be phased into the complete lighting range over the next few years. The first tubes to benefit will be Triton, the specialist freshwater plant and marine lighting tube, followed by Blue Moon, the after-dark viewing and coral-enhancing lamp and, finally, Beauty Light, the unique tube for enhancing colours in the freshwater aquarium.

For further details, please contact Adrian Exell at Interpet Ltd, Vincent Lane, Dorking, Surrey RH4 3YX. Tel: 01306 881033.

Let There Be Light! (2)

Arcadia has further developed its range of metal halide lighting, known to be the best light source for marine aquaria, following their original success with their 6500°K single-ended metal halide lamp. Through extensive research Arcadia has developed a new 10,000°K, double-ended metal halide

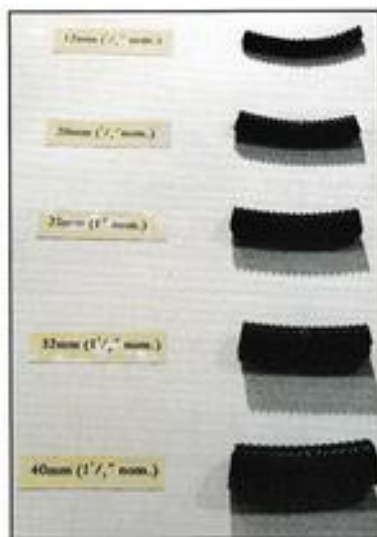
The Arcadia Metal Halide Lamp.



BUY LINES

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

lamp of excellent quality with a very high light output of 10,000 lumens. This improved intensity is ideal for all marine reef aquariums. The colour temperature of 10,000°K replicates the light in the shallow waters of the coral reef. It is a well-known fact that red/yellow wavelengths penetrate through water poorly, whereas blue/violet light reaches much greater depths. The spectrum of the Arcadia lamp has an ideal composition, which not only fulfils the needs of corals and invertebrates for rich blue light, but also accentuates the natural colours in the aquarium. The excellent performance and high colour rendition of the lamp, achieved by the spectrum,



Cypriflex hoses.

ensure that the natural beauty of fish and corals are brought out to the full. The lamp, therefore, provides the ideal combination of the best light environment for the marine life and optimum viewing for the aquarist. The 150W version of the lamp is now available with the 250W version to follow. As can be seen from the photograph the lamp is supplied in colourful packaging complete with technical details and spectral distribution chart. Details from: Arcadia,

Jerrard Bros plc, New Cairo Road, Croydon, Surrey CR0 1XP. Tel: 0181 688 8222. Fax: 0181 681 3119.

More Hose for your Money

When buying hose for pond use it doesn't pay to take the rough with the smooth unless you choose Cypriflex. The smooth is the internal bore, to permit maximum flow-rate.

Now Cypriflex, the best possible link-up between the pumps, filters and UVCs that make up the life-support system of your pond, is better value than ever. Such is the popularity of this reliable and readily

available hose that Cypriflex have been able to reduce the retail price per metre by up to 71p RRP.

Last year's prices are in brackets: 12mm—1/2in nominal — £1.49 (£1.65); 20mm—3/4in — £1.79 (£1.95); 25mm—1in — £2.49 (£2.50); 32mm—1 1/4in — £2.99 (£3.60); and 40mm—1 1/2in — £3.79 (£4.50).

Cypriflex, specially made in the UK for Cypriflex, is guaranteed against leaks for two years, is extremely flexible yet durable — even in cold weather — and offers minimal loss of flow-rate.

Its dark green colour blends in with most pond set-ups and, of course, Cypriflex is designed to team up with the full range of Cypriflex filtration packages.

Flexible hose is a better option than rigid pipework in many situations, doing away with flow-reducing bends and elbows and giving total security when installed with Cyprio hoseclips.

Cyprio recommend that the widest-permitted bore hose be used in between pump and filter, as a seemingly insignificant reduction in internal diameter can give a measurable drop in flow rate.

For further information on Cypriflex and all other Cyprio products, contact: Cyprio Limited, Haris Road, Fagnall, Deeping St James, Peterborough PE6 8RR. Tel: 01778 344502. Fax: 01778 348093.



The comprehensive range of Salifert Test Kits.

New Marine products

Salifert has released some new additions to an already comprehensive Test Kit range. The new Kits include the following: Magnesium, Boron,

Organics, Iodine, Copper, Strontium, Ammonia, Oxygen and Silicate.

Salifert are also introducing a range of selected reef aquarium additives for addition to aquariums that may be lacking in essential elements. Having the ability to accurately determine the these levels prior to the addition of any additives is essential, as every aquarium consumes them at different rates.

An information leaflet is available on these products from: Tropical Marine Centre Ltd, Salesbridge Road, Chorleywood, Hertfordshire WD3 5SX. Tel: 01923 284151. Fax: 01923 285840.

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BOOK & CD REVIEWS

Aqualog Reference Fish of the World: South American Cichlids I

Authors: **Ulrich Glaser
Senior and
Wolfgang Glaser**

Publisher: **Aquarium Glaser
(Verlag ACS GmbH),
Germany**
Price: **£29.95**

For a long time fans of the larger South American Cichlids have, with some justification, felt neglected as far as aquarium literature is concerned. Books on Rifts are commonplace nowadays. There are several good volumes on Central Americans, and Tetra have recently made their Dwarf Cichlid books (West Africa and South America) available in English — leaving just that one big gap.

There is, of course, plenty of information available on such old favourites as Oscars, Severums, and Festivums, but recent years have seen the arrival in our hobby of a number of more exotic species, chiefly from the 'Pike Cichlid' and Geophagine groups, with the promise of many more to come. But to date we have had very little to help us identify and care for these exciting new cichlids. And it is helpful, especially when dealing with Pikes, to know BEFORE you buy it whether you are dealing with a harmless 4in insectivore or an ultimately 12in+ long fish-eating predator!

This new book from Aquarium Glaser goes a long way towards filling the gap in the literature. It is a splendid catalogue of Cichla, Crnicichlo, Telocichlo and Geophagine species, containing practically every species that I have heard of, and quite a few more besides. Primarily a 'picture book', it is an illustrated guide for identification purposes, each photo being captioned with the scientific name, sex, size and geographical origin of the fish concerned; as such it should

represent the answer to every harassed aquarist's, not to mention judge's, prayers. In addition the use of pictograms permits a lot of additional useful information — habits and maintenance — to be provided on a single line, and by referring to the pictogram key inside the back cover the aquarist will find all the basic information he needs to start keeping the species — or decide not to, as the case may be!

The book is bilingual (German and English), so its German origins pose no problems for the English-speaking hobbyist. The photographs are in the main superb, and will have every keen cichlidophile champing at the bit in anticipation of some of the more stunning species reaching our shores. Supplementary photographs are to be issued annually, to be attached to the special blank update pages at the back, so that the book can be kept up-to-date with new discoveries.

South American Cichlids I is, as the title suggests, just the beginning — a whole series of books, in the same format, is planned by the publishers. A volume on Loricariid Catfishes has already been published.

South American Cichlids I is available from British Cichlid Association Sales (Dept AP), 46 St Margarets Road, Ardrossan, Ayrshire, KA22 7EW; price £29.95 (including P&P). Trade enquiries are welcomed by the UK distributor, Miss Fish (UK), Tel. 01604-234844.

MARY BAILEY

Aqualog Reference Fish of the World: South American Cichlids II

Authors: **Ulrich Glaser
Senior and
Wolfgang Glaser**

Publisher: **Aquarium Glaser
(Verlag ACS GmbH),
Germany**
ISBN: **3-9-1702-07-3**
Price: **£24.95/£29.95**

In the past books on South American Cichlids have been few and far between, but this year has seen the publication of two excellent volumes: first the splendid Aqualog book on Pike Cichlids and Geophagines, and now its sister title on the dwarfs of the genera Apistogramma, Apistogrammoides, Bioteoia, Crenicora,

Dicrossus, Microgeophagus, Nannacara and Toeniocara.

Many (most!) of the species included have not yet been seen in the UK, or only briefly, and at the best of times any but the few 'common' ones take quite a lot of finding. And when you do manage to locate them, identification is the next major frustration. Ownership of this book should go a long way towards solving this problem, although a huge number of the species shown have yet to be given scientific names. But all have been given 'trade names', and the book allocates each an ID number, so at least we will now have a reference system until science catches up. Which may take a while — it will come

as quite a shock, even to enthusiasts, to discover just how many species are now known, and available in the hobby, on the continent if not here.

As with the previous volume, the content is almost entirely photographic, showing both sexes in most cases, essential for what are generally sexually dichromatic cichlids. Pictograms, explained inside the back cover, provide information on requirements and habits. In addition, the introduction gives general details of the group, together with a set of maps showing the distribution and characteristics of the individual groups within Apistogramma, something which I, for one, have not seen satisfactorily explained before in any hobby book.

As before the text is bi-lingual — German and English — and although there are one or two tiny 'glitches' in the latter, the sense is nevertheless clear. If I do have a criticism it is that a very small number of the photographs are of less than top quality, but these cichlids are notorious for hiding from the 'big eye', and better to have the book now than to wait, perhaps for years, for A1 photos of everything; the vast majority of the photos are excellent.

No dwarf cichlid enthusiast should be without this book, nor should any wholesaler/retailer who regularly stocks these fishes. It is available from selected retailers, or by mail order from BCA Sales (PFK), 46 St Margarets Rd, Ardrossan, Ayrshire, KA22 7EW (Vol. I is also available from BCA Sales, price £29.95 inclusive).

MARY BAILEY

African Cichlids I: Cichlids from Eastern Africa

Authors: **Wolfgang
Staeck and
Horst Linke**

Publisher: **Tetra Press**
ISBN: **1-56465-167-3**

Cichlids from East Africa is one of the three cichlid books by German authors Staack and Linke. These have recently been translated into English and updated with new photographs courtesy of TETRA.

The area covered by the book is supposed to be all of East Africa as well as Lakes Victoria, Tanganyika and Malawi. As every cichlid lover knows, each Lake alone is home to 400 to 500 different endemic species of cichlids. So all this book can do is try and whet our appetite in a big way, which I think it probably manages to do. This 199 page book covers 80 species in 32 genera. Although this book purports to cover East African cichlids, in reality it dwells mainly on cichlids from Lakes Tanganyika and Malawi. The biggest groups discussed are *Neolamprologus* and *Tropheus* from Lake Tanganyika and *Pseudotropheus* from Lake Malawi.

Two pages are usually devoted to each species and this includes a map indicating where the fish are found.

Each species has a colour photograph of the male together with some interesting facts and brief description of the fish. This is followed by a section on natural habitat, care and breeding. All this, together with the first two general chapters, offer useful information to the cichlid enthusiast in setting up a suitable aquarium habitat for the successful maintenance and breeding of these cichlids.

Although cichlids of Lake Tanganyika and Malawi are well covered in other publications, *Cichlids from East Africa* does give in depth information to the species covered not always found elsewhere. Personally, I would have preferred better coverage of Lake Victoria cichlids and am still waiting for a good hobbyist book devoted to these cichlids. That said, I have enjoyed reading *Cichlids from East Africa* and would suggest that £14.95 is a small price to pay for this book.

DR IGGY TAVARES

Goldfish Breeding & Genetics

Authors: **Joseph Smartt & James H. Bundell**

Publisher: **TFH Publications**
ISBN: **0-7918-0090-0**
Price: **£24.95**

With the captive breeding of Goldfish going back thousands of

years, you'd think that all that could have been committed to paper would have been by now. But the culture of that venerable species, *carassius auratus*, is still very much an ongoing proposition with much to be absorbed and with new strains emerging every day.

Although new strains are constantly appearing it is the reasons for their appearance that makes this book so fascinating: can fishkeepers predict what the new colour strain or finnage development might be with any certainty than their earlier counterparts? With the aid of this work, by two of Britain's experts in the field, you might even consider putting money on it.

The work is divided into approximately two halves (at least by this reader): the first contains the History and evolution of the Goldfish, the Varieties of Goldfish, Genetic Principles for the Goldfish Breeder and Goldfish genetics; the second part is, if you care to regard it that way, more of a practical nature covering Goldfish and their Aqueous Environment, Brood Stock Management, Development, Rearing, Culling and Selection, Showing and Judging and the Future of the Goldfish.

Of these two halves the first is where some serious application of 'the little grey cells' is required, such is the depth of argument and detail of information. But by persevering, you will obtain a good grounding in genetics involved in producing the wide variety of fishes that fascinate Goldfish keepers so much.

The second half provides much more familiar territory as much of the subject matter will be almost second-nature to the experienced fishkeeper; nevertheless, it serves an admirable purpose in again providing excellent coverage of aquarium management — ponds are only obliquely referred to as possible over-wintering quarters and for 'flock-spawning, most of the action occurs within the well-controlled parameters of the breeding and raising aquaria.

For the technically-minded, one of the three Appendices tabulate Summaries of breeding information and records done by Matsui, the renowned Goldfish authority. Other Appendices provide valuable reading lists and details of Goldfish Societies.

The illustrations are superb, the now taken-for-granted high-quality, laminated pictures almost leaping from the page demanding attention. This is

obviously a book that needs to be (and will be) read many times, as each time you will absorb, and become absorbed, with the sheer wealth of information at your fingertips. It is destined to become the Goldfish Breeder's handbook for a long time to come.

DICK MILLS

The Modern Coral Reef Aquarium — Volume 1

Authors: **Svein A. Fossa & Alf Jacob Nielsen**

Publisher: **Birgit Schmettkamp, Verlag, Bornheim, Germany**
ISBN: **3-928819-29-1**
Price: **£65.00**

It is vital, for any aspect of fishkeeping, to know how things work in Nature before you can begin to replicate the correct conditions for the animals in captivity. With the growing interest (bolstered by first-hand holiday experiences) of the reef aquarium, no longer are mariners contented with lifeless corals adorning their aquaria. Now living rocks and invertebrates are to be included, even if it means comprising the choice to accommodate compatible fishes.

The book begins with examining real coral reefs; its producers and its consumers, its multiplicity of zones and micro-organisms. The four major zoogeographical areas are visited — the Indo-Pacific, the eastern Pacific, the Caribbean and West Africa. Once sated with such visual splendours the proposition of a Coral Reef in the aquarium is studied.

Following setting-up and decorating, various forms of reef aquaria are analysed — Fish, Community, Sand Zone, Reef Gorge, Cave and Reef Profile — each bringing its own particular set of conditions to be met. The remaining chapters deal with such important aspects as the initial Breaking-in Period and the acclimatisation of the animals (even those impaired by cyanide-assisted capture), Live Rock, Light, Temperature Control, Water, Biochemical Processes, Filtration, Water Maintenance and Hydrotechnology. A large chapter is given over to Algae, not to remedy its nuisance value but to actively use it as a natural, and very decorative, addition to the aquarium. A final section addresses the modern problems of dubious methods of fish

collection, destruction of the coral reefs and the fish mortalities in the aquarium trade. However, the book ends with an optimistic note with the observation that there is much aquarists can do to improve the lot of the marine fish and its home, the coral reef either in the home or in the wild.

Production quality is superb and everything the existing or potential serious reef aquarium keeper could wish for is here. Future volumes (there are three more to come) will cover Cnidarians, Invertebrates and Fishes respectively but the series is not expected to be completed until late 1999 — what a present to give yourself for the Millennium!

DICK MILLS

CD-Rom

Worlds of the Reef

Publisher: **Ransome Publishing, Ransome House, 2 High Street, Watlington, Oxon OX9 5PS**
Price: **£39.99**

Taking a trip beneath the tropical waves of the coral reef usually meant a long-haul trip and no little expenditure.

Now, you can experience it all from the comfort of your computer chair with the added attraction of not even getting jet-lagged (or wet) in the process!

Subtitled 'A Multimedia Expedition to the Rainforests of the Sea', the Introduction by David Bellamy puts you in the right, conservative frame of mind to appreciate what you are about to discover.

Fittingly, you do not just dive straight in, but you attend diving school, becoming familiar with the kit and diving techniques first. There is a Field Centre and mini-Museum where you learn more about the animals and the reef itself then it's off to the reef. There are several areas to experience, the Southern Lagoon, and a Mangrove swim; for the brave how about a Shark's cave or a night dive. Mermaids and Manatees are also on the agenda, as are over 100 superb video sequences, 400 sound clips and narrated tours; 300 photographs and illustrations, a Scrapbook and print facility and a 'satellite link' to other reefs all add up to a complete reef experience you will revisit over and over again.

DICK MILLS

Updated show list available

For the latest, most accurate Show dates and venue information please refer to the Quarterly Supplement issued by the FBAS giving details of Shows around the country. The Show Supplement is available price 50p post paid from: Show Information, Dept FW, 22 Flamsted Avenue, Wembley, Middlesex HA9 6DL.

In order to provide the most complete service to all Societies please communicate your Show information to the same address.

Hounslow's loss

Most Societies have a couples membership scheme but it is also not unknown that should one partner cease to be a member the other 'half' soon participates less in Society activity. Marjorie Pratt, of Hounslow A.S., proved to be an exception for although it must

have been around 20 years ago since she lost her husband Bert she remained an active member of Hounslow as a practising aquarist — even taking Best in Show, with a Lobes, at the Society's recent Closed Show a few weeks ago — right up to her passing, from a heart attack, in

the middle of November. She was proud of her association with the Society, where she was the power behind the 'refreshment services'; she was truly disappointed this year when Hounslow's Open Show date was moved, to avoid clashing with the September General



Assembly meeting, she found herself on a pre-arranged trip to Bournemouth instead of taking care of the Judges' lunches. Such is the stuff real enthusiastic Society members are made of and all the members of Hounslow will be saddened by her loss.

Joe's back, Jack moves up

At the December Annual General Meeting of the Federation of British Aquatic Societies the changes of Officers and Council members are as follows:

President: Jack Stillwell (Portsmouth A.S.); Chairman: W. J. Nethersell (Riverside A.S.); Merchandising Officer: Roger Crew (Isle of Wight A.S.).

The remaining Council positions remain unchanged with the now vacant Vice-Chairman's post previously held by Jack Stillwell to be filled at the March General Assembly.

Juniors get Weston off to a flying start

John & Liz Pell, Show Secretaries, SUPREME JUNIOR FISH SHOW report on a new event

The Supreme Festival of Fishkeeping at Weston-Super-Mare has, over the years, become one of the premiere events in the hobbyists' calendar. This year, again sponsored by Rolf C. Hagen, in association with the Federation of British Aquatic Societies (FBAS), saw many of the favourite attractions returning to the enjoyment of those in attendance.

As with any annual event, it is important to introduce new ideas to the programme. Whilst not specifically titling November 2 'Juniors' Day', there was a conscious effort to encourage younger members to be a part of that day in some way. Linking this with the quest for innovation, the first SUPREME JUNIOR FISH SHOW was held on the Saturday. With the introduction of new ideas, there must be a certain amount of trepidation, however, we need not have concerned ourselves, the youngsters were brilliant. As with many Shows the first half hour or so after the doors were opened was somewhat hectic, particularly with the paperwork, however, there was order in the proceedings and, with 'Uncle Jim' Carney fielding all sorts of questions on fishkeeping and showing the morning

moved inexorably towards judging time. With Jim overseeing as Senior Judge, the team of W.G. Best, K.R. Doswell, J. Egan, C. Harding, J.C. Hill and L. Pearce worked their way through the Classes. Our thanks go to all of these gentlemen and in particular to Mr Doswell for taking on Class Q with 21 entries!

The Best Fish In Show had been chosen and it was time to let everyone back into the Show Hall. Any last minute worries we may have had were very quickly dispelled by the shrieks of delight as, first, one or two Juniors, and then many more found their fish had won a Place Card. The look of sheer delight on the faces of the youngsters as they collected their Awards at the ceremony later that afternoon told us of the success of this new feature at Weston.

Trophies and 'T' Shirts (by BTC), Show Tanks (by Spa Glass and Terry Waller) and Place Cards were presented by Andrew Bartyla of Hagen and Peter Furze, Chairman, FBAS. In addition, all other participants received 'T' shirts and Show Tank and assorted tubs of Nutrafin Fish Food.

The facts and figures were: Ninety-nine entries, with Best Fish in Show being awarded to an *Etheostoma coeruleum* owned by Luke Powell of Erith & District A.S. The Highest-pointed Individual was Robert O'Grady of Swansea A.S., 2nd Matthew Fiddes from Mortlake, 3rd Michael Bradbury from Hemel & District A.S. and 4th Daniel Joseph of Erith & District A.S. Robert's individual success also



Best in Junior Show Luke Powell, Erith & DAS, with Peter Furze, Chairman, FBAS, and Andrew Bartyla of Rolf C. Hagen (UK).

PHOTO: AAP LIBRARY

earned Swansea A.S. the Highest-pointed Society Trophy, 2nd Seascale, 3rd Hemel & District A.S. and 4th Erith & District A.S.

Our final thanks go to all who participated in the Show (mums, dads, teachers included) and to those who helped, both with the lead up and during the Show.

DIARY DATES

JANUARY

7 Gloucestershire A.S.
Monthly meeting, Bell & Gavel,
Castle Market, St Oswalds
Road, Gloucester. Inter-Club
Quiz and Auction. Contact
Andy 01452 372948 or
Christina 01242 520428.

MARCH

16 C.A.S.T. 88. Boy's Brigade
Hall, Castle Street, Caergwrle,
Flintshire. Aquatic Auction,
Deskling of Lots 10.30am-12
noon. Or in advance to: Peter
Jones, 01078 701820. Or to 1
Hope Street, Caergwrle,
Flintshire LL12 9AA.

OPEN SHOWS

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

2 March Burley-in-Wharfedale
A.S.

15 March Kent Association of
Aquarist Societies

Convention, Smithys Hotel,
Margate, Kent.

30 March Northampton A.S.

7 April Eastleigh A.S.

12/13 April Yorkshire Aquarist
Festival, Doncaster.

13 April Aberdare A.S.

20 April Strood A.S.

3 May Southend, Leigh & D.A.S.

4 May Musselburgh A.S.

11 May Corby A.S.: Four Lane
Ends A.S.

16-18 May Grocklemania (Isle
of Wight A.S.)

7 June South Park A.S.S.

14 June Bristol Tropical A.S.

(New Date)

22 June Workington A.S.

29 June Seascale Junior
Fishkeepers.

5 July Port Talbot A.S.

20 July Bournemouth A.S.

27 July Kent Association of
Aquarist Societies.

24 August Cramlington A.S.

31 August Tyne Tees Area
Association.

13 September Hounslow A.S.

12 October Solway A.S.

25/26 October British
Aquarists Festival, Bowlers,
Manchester.

31 October/2 November

Supreme Festival of
Fishkeeping, Weston. 2

November Supreme

Championship and Open
Show.

You Write

Dear Sir,

I am not often spurred into putting pen to paper but on this occasion I really think I should.

After a lapse of nearly 10 years I was persuaded by my two sons to keep Discus again; as I had bought all my fish from Brian Middleton, of Middleton Discus, nearly 18 years ago I was surprised to see he was still breeding Discus. All the fish I had bought off him many years previous were of the highest quality, so it was only natural to assume his present stock would be of the same.

To cut a long story short, I was not disappointed. We purchased six Red Turqs and six Greens. On returning home one of the Greens had not travelled very well and over the course of the next three days it got worse until it was almost dead. A quick phone call to Brian suggested I try CQD; off to Usk I went to fetch some where Brian insisted on replacing my fish even though it was not yet dead.

I returned home and put the CQD into the tank, took one last look at my now all but dead Discus and went to wash my hands. On my return — no fish on the bottom! I was dumbstruck; there was my all but dead fish up and swimming, it was unbelievable.

Back on the phone to Brian. He was hardly surprised, saying it's always the same story — fish close to death, up and swimming in minutes. CQD is an amazing product as such fish years ago would have been lost and, at the price of Discus, who can afford to lose fish? So, thank you Brian and family, and thank you CQD.

D. Jones,
Leominster, Herefordshire

Letters for publication should be addressed to:
The Editor, MJ Publications Ltd, Caxton House, Wellesley Road,
Ashford, Kent TN24 8ET

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