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JANUARY 1995 VOL. 59 NO. 10

EDITORIAL

Aquatic Industry Wins Breathing Space

As we have reported in recent months, several vitally important proposals concerning the aquatic industry and, hence, our hobby, were due to come up for discussion at the CITES conference which was held in Fort Lauderdale, Florida, in mid-November.

Had some of these proposals gone through as listed, we would now be looking at the virtual wipe-out of certain essential sectors of the aquatic trade. Fortunately, energetic lobbying by the industry, several important fish-producing countries and bodies like the Worldwide Fund for Nature and the Environmental Investigation Agency, have resulted in welcome, sensible 'breathing space' for all concerned.

The aquatic industry was represented at the conference by Ornamental Fish Industry (UK) Chief Executive, Keith Davenport, and by Ornamental Fish International US Advisor, Leif DeMason (proprietor of Old World Exotic Fish, Inc., who specialises in African Rift Lake Cichlids).

Preliminary reports from both parties indicate that, most notably, figures which were being proposed with regard to numbers of adult specimens in a population and the restricted geographical range of species, were transferred to an annex to be used as guidelines, rather than strict 'rules', when considering species for listing under the CITES Appendices.

This has provided the breathing space referred to above. But don't let's be fooled; all we've got is breathing space, nothing more. We now need to get our act together... and soon (!)... and come up with solid scientific data to back up our arguments in defence of our hobby and industry.

It is also time for those few, and sometimes sadly ill-informed, voices within the hobby, to adopt a more constructive and enlightened approach and get solidly behind those who are trying to keep our hobby and industry alive, not just for 1995, but into the next century as well.

John Dawes

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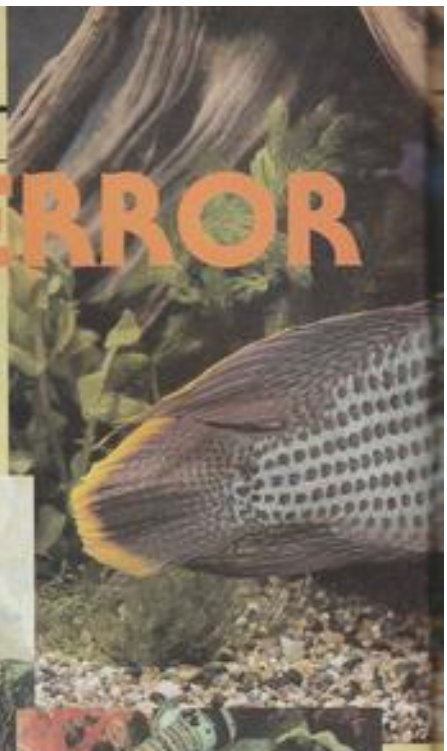
KEEPING AND BREEDING:

THE GREEN TERROR

It's big and it's beautiful and, what's more, it's easy to breed. As **Martin Chandler** shows this robust cichlid has a lot going for it.

Photographs — unless otherwise indicated — by the author



Who would ever want to keep a fish with a name like "The Green Terror"? The answer is: a large number of cichlid fans the world over for, despite its somewhat 'pugilistic' name, the sheer beauty and intense egg/fry care behaviour of this substantial fish, make it a highly desirable species for anyone who can cater for its needs.

Aequidens rivulatus (Gunther, 1859) was originally described as *Chromis rivulata*, but has since been placed in various genera of cichlids that originate from Central and South America. For many years in the latter part of the last century, it was placed in the genus *Acara* Heckel, 1840. However, when, in 1894, a revision of many of the then known large American cichlids were revised and the genus *Aequidens* Eigenmann and Bray 1894 was erected, the species was placed in this genus, where it has since remained.

The common name of "Green Terror" is in recognition of this fish's pugnacious appearance and its aggressive behaviour towards other cichlids, especially at breeding times. Apart from the common form, there are also two colour variants generally available, namely the "Gold Saum" and "Silver Saum". These names refer to the gold or silver edging carried by the fish along the outer edges of the dorsal and anal fins.

For many years it was throught that all of these variants were actually just differing colour forms of the same species. Recent studies that have been carried out now suggest that, while these fish may be very similar in colour, size and temperament, they could, in fact, be different species.

The fish that I have been keeping and studying for the last eighteen months is the "Gold Saum", which is an exceptionally beautiful fish, with the males displaying a vivid array of colours and a temperament to match much larger fish. However, this aggression usually only shows when the fish pair up in a community set-up.

In the wild, the Gold Saum is to be found in northern Ecuador, where it shares its waters with some of the larger species of "*Chichlasoma*". This probably explains the aggressive spawning behaviour, as the competition for spawning sites in nature is important if the species is to survive.

The female on one of her egg-laying passes, with the male standing guard.

Size and Colour

The male Gold Saum is quite capable of growing to a size in excess of 9in (23cm) in total length, larger than most of the other species of the same genus. The male is also a deep-bodied fish at the head, but tapers back towards the caudal peduncle. During spawning a nuchal (forehead) hump develops, which soon shrinks once a pair are separated.

The face and lips are marked with blue/green iridescent stripes with a dark line below the eye. The flanks are covered in large green/gold scales, each tipped with a dark spot. The colour of these scales changes to a green/blue when the fish is spawning or in an aggressive mood. In the centre of the flanks is a dark patch with two pale stripes either side, leading down to the stomach region.

If this colour was all that was present on the fish, then it would still grace any tank. However, the feature which makes these fish stand out are the fins. The pelvic, anal, dorsal and caudal fins have a base colour which is of a deep purple, dotted with iridescent green. The dorsal and caudal fins are edged with a 3mm band of orange or red from which the common name of the fish is derived. The pectoral fins are a translucent blue.

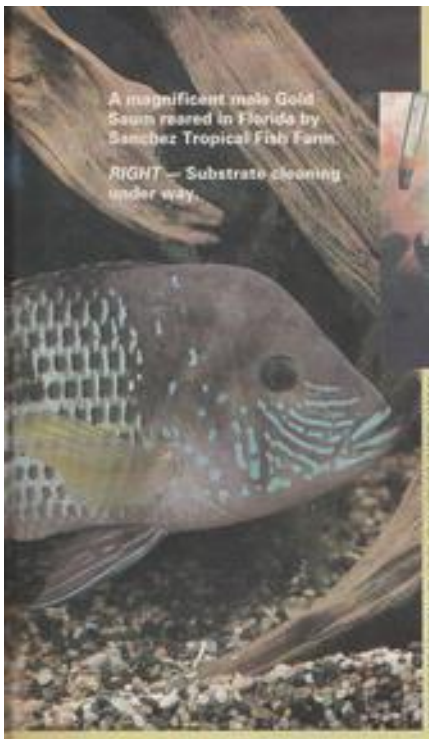
The female attains a total length of up to 6in (15cm), but this size will be greatly reduced if she is allowed to breed too early, as her energies are put into egg production and care for her family, rather than in growth.

The male guarding his shoal of tiny fry (seen in the space between his head and the bottom edge of the heater).

Although not as colourful as the male, the female Gold Saum is no slouch when it comes to colour. She is a much shallower and plumper fish, without the steep forehead and deep flanks that are to be found on adult males. The base colour of the flanks is a grey/brown dotted with the odd blue/green scale. The fins have all the colours of the males, but are not quite so bright.

Aquarium care

A single pair of this species may be housed in a tank of 36 x 15 x 12in (90x38x30cm) minimum, with single specimens easily fitting into a cichlid community aquarium of 4ft (120cm) or larger. While an immature or sub-adult pair can also be kept in this situation, once they begin the breeding process, it is advisable to remove, either the other occupants to another tank, or the pair themselves. If



A magnificent male Gold Saum reared in Florida by Sanchez Tropical Fish Farm.

RIGHT — Substrate cleaning under way.

MARK SANCHEZ/FLORIDA TROPICAL FISH FARMS ASSOCIATION

not, then it will soon be seen just how this species got its common name of Green Terror!

I have maintained this species in tanks fitted with both undergravel filters and power filters. I personally prefer to use airdriven undergravel filters. As with most cichlids of this group, Gold Saums tend to dig into the substrate at spawning times, but not to any excess, with only small areas of the filter plates being exposed. Of course, the use of a gravel tidy can be employed if necessary at this stage.

The water should be hard and slightly alkaline, with the temperature maintained at around 78-80°F (c25.5-26.5). Tank decor should consist of some interestingly shaped rocks for effect, but with some flat surfaces. A few pieces of slate of up to 8in (20cm) in diameter should be laid on the gravel, as, when breeding occurs, the fish tend to prefer such a flat surface.

As with most of the larger American cichlids, plants, either real or plastic, would not really have any place in such a set-up, since they would not last very long, being dug out and attacked by the fishes. I would also avoid bogwood because it can lower the pH of the water, especially if the wood is fairly new and still capable of leaching out tannis.

Aequidens rivulatus are not fussy feeders and will accept most types of cichlid pellets, earthworms, maggots or insects. They are quite messy at feeding times and scavenging catfish, such as *Hypostomus* species, the "Plecs", should be kept with them to clear up any remaining scraps of uneaten food. Because of this feeding behaviour, regular water changes and tank cleaning activities are even more important than usual to avoid a possible build-up of harmful wastes in the tank.

There are two methods which can be employed to try to obtain a breeding pair of Gold Saum, the first being the 'old faithful' where by you obtain a group of at least half a dozen juvenile specimens of around 2in (5cm) in length and grow them on to adulthood when they will then select their own partners.

One possible problem with this method is that the fish are more than likely inter-related, ie brother and sister, and will easily begin to breed at a small size (under 4in-10cm is not uncommon). If they are allowed to continue like this they will not reach their full potential size and the possibility of genetic deformities are more likely to occur.

Of course, method two of obtaining a pair is to purchase an already proven couple of the species.

It is relatively easy to introduce adult Gold Saums to each other. Initially, add them with a few target fishes into a tank set-up. It should only take them a day or two to pair off, and when they begin to display and defend a particular territory, it is time to remove the rest of the occupants.

Courtship

The male initiates the courtship ritual by displaying to the female by quivering and by swimming around her with his fins fully erect and his head shaking. The female will respond by darkening her body colours and, over the next 48 hours, her abdomen will swell with eggs and her orange ovipositor will show.

She will then select a spawning site, usually a horizontal surface, which will then be cleaned scrupulously, removing all of the gravel around the chosen site until it has all been dug away.

Spawning takes place in the evening and is preceded by the female making a few trial runs over the site before the actual egg-laying begins. Egg-laying will last about an hour, with the female depositing eggs in lines of around ten at each pass. The male then follows closely behind, fertilising the eggs the female has just laid.

The eggs are light orange in colour and number about four hundred. Once the spawning is complete the female becomes very protective, not even letting her mate assist in their care.

The male now becomes even more aggressive in his behaviour and even anyone approaching the tank is subjected to his attentions as he comes to the front glass and his colours intensify, with his flanks taking on a blue/purple sheen.

After about 24 hours the eggs will darken as the eye spots develop. Any that are infertile will turn white and be removed by the attentive female. At 48 hours, the eggs begin to vibrate vigorously as they begin to hatch. The female will mouth the eggs, thus helping the emerging fry, and then deposits them into a nearby pit that has been previously dug for this purpose.

CARE TIPS

Aquarium:	36 x 15 x 12in (90 x 38 x 30cm) minimum
Superlative:	78-80°F (c25.5-26.5°C)
Water:	Hard and slightly alkaline
Diet:	Will eat most foods

After-care

At this stage, the male is allowed to assist in this task, but she watches him very closely. Several nursery pits are used by this species and the wriggling fry are moved between them several times during the day.

After five days post-hatching, the fry become free-swimming, by which time their yolk sac, on which they are sustained, will have become greatly depleted. Feeding can now commence with newly hatched brine shrimp or powdered fry foods. To ensure a good rate of growth the young should be fed on small amounts of food at regular intervals; six times per day is not excessive. Tank maintenance is even more important at this time, and a 20% weekly water change should be carried out to help ensure the young stay strong and healthy.

At six weeks, the young will measure around ½in (1.3cm) in length and take on the appearance of the parent fish. There will still be a lot of them, so to ensure that they continue to grow well, the best fifty or so should be kept, with the rest being culled.

While this may not seem to be a very pleasant task, it is well worth doing. Apart from the space required to try and rear all of the brood, you will always, even among the young, get more dominant specimens which will, in the long term, greatly retard the growth of their lesser relatives that will receive proportionally smaller and smaller amounts of available food and space.

There are also other good reasons for culling the young at about the six-week stage. You will find that if the parents are left with the juveniles, the female will come into breeding condition again, often spawning while young from the previous brood are still with her.

She will then try to rear this second batch but they will be seen as a source of food by their elder brothers and sisters. The parents will therefore, in turn, attack the older young in defence of their latest offspring; the results are invariably fatal for the first brood. AP

Tomorrow's Aquarist

BY GINA SANDFORD

Stop Press!

Just had a phone call to tell me that the Northern Area Catfish Group are holding their Annual Convention on 19 February in Wigan; I presume, at the Wigan Pier complex as usual. I've got no details of speakers at the moment, but I'm sure I'll be able to tell you that next month. So, if you're interested in catfish, or just want a fun day out, put the date in your diary.

Ten Snakehead facts

① In the Sri Lankan population of the Snakehead, *Channa orientalis* - also known as the Ceylonese Green Snakehead - some specimens occur with pelvic (ventral) fins and some occur without. Bet that confused the scientists!
② In the same Sri Lankan population, those fish with pelvic fins (ventrals) mouthbrood their eggs for 3-4 days and produce up to 200 fry, but those without pelvics mouthbrood their eggs for up to 10 days and only produce about 40 fry.
③ The eggs of Snakeheads (*Channa* spp) float.
④ The fry of *Channa obscura* (the Square-spotted African Snakehead), have been seen to shoal together in a defensive manner so that the whole group resembled a much larger Snakehead, and thus deterred predators.
⑤ Snakeheads can survive for several months buried in holes in bogs, provided their skin is kept moist.
⑥ Because of their size, Snakeheads are regarded as food fish in their native lands.
⑦ To allow them to survive in adverse conditions, Snakeheads have an accessory breathing organ that permits them to breathe air; thus, they can often be found in very polluted waters.
⑧ If you want to keep Snakeheads in captivity, you need a very large aquarium. The smallest species that is usually available is *Channa orientalis*, which can grow to 30 cm (12 in) but usually only attains 15-20 cm (6-8 in). One of the largest is the African Snakehead, *Channa africanus*, which grows in excess of 100 cm (39 in). The Red Snakehead, *C. micropeltes*, probably the most often seen in aquarium shops, also reaches 100 cm.
⑨ Snakeheads are very sensitive to salt, so this should never be added to their aquarium.
⑩ Snakeheads jump. Be warned! Use a cover glass.

MIKE SANDFORD

▲ Snakeheads are powerful fish.

The Tawny Dragon

The specific name (ie the second part of the scientific name) of the Bagrid Catfish, *Pelteobagrus fulvidraco*, means Tawny *(fulva)* Dragon *(draco)*. It is thought that this might allude to its ability to inflict very painful wounds with its pectoral spines. I think there's a warning in there somewhere that reads "Watch it when handling this fish!"

The Tawny Dragon comes from the Amur Basin in Northern China and southeast Siberia, which is not a region we normally associate with fishes for the aquarium. Growing to about 32 cm (13 in), it is fished commercially. I haven't a clue what they are like to eat, but maybe someone out there has tried one and can tell us! It inhabits streams and lakes, feeding from the substrate on insect larvae, molluscs and, very occasionally, fishes.

During the summer, the fish breed, digging a shallow nest in the mud of the riverbed. The male then guards the nest until the fry hatch some 48 hours later.

Perhaps of most interest to us is the fact that this fish can tolerate low temperatures and can, thus, be kept in the coldwater aquarium; it certainly makes a change from the North American Bullheads. It is easy to feed, taking most foods, from earthworms to pellets. Although it is not fussy about water conditions, do make sure the tank is well-filtered; the fussy bit refers to acidity/alkalinity and hardness; it won't survive in

Tawny Dragon in catfish clothing ▶

MIKE SANDFORD

polluted water. As the fish feeds from the bottom, the filtration system will also help to keep the water clear when the fish stirs up the mulm.

On a cautionary note, be careful what you keep the Tawny Dragon with. Your prized Veiltail Goldfish may become food for this catfish!

What's the common name?

Our Editor is always having to remind me to use the common names for fishes and make sure I've explained the technical terms properly. I don't think a month goes by without me forgetting a common name or a description. Maybe I'll get it right one day.

MIKE SANFORD

African Knifefish - Note its smooth fin-less back.

DEREK SMITH

The Sucking Loach ... or Chinese Algae Eater ... or ?

Well, the other day the 'perfect' book arrived in the post. It is called *World Fishes Important to North Americans* and published by the **American Fisheries Society**, Special Publication 21, ISBN 0-913235-53-9. It lists fishes which are not only important commercially as food fish, but also those that are kept in aquaria. As our common names and American common names are becoming more and more interchangeable, I've found this book invaluable.

Looking at the entry for the Sucking Loach, *Gyrinocheilus aymonieri*, I see that in the US it is referred to as the Siamese Algae-eater; there is also a list of other names: Chinese Algae-eater, Siamese Headbreather, Sucking Loach and Sucker Loach. Two key letters indicate its importance: (A) it is an aquarium fish and (T) often referred to in text books, the popular press and the media. Finally, I am told its distribution.

Guess this book puts me one step nearer making our Editor's day! Just a thought: you could try ordering a copy from your local library - it may take a while for them to get it in, but the system usually works.

THE DIFFERENCE IS.....

① You can tell Sleeper Gobies (family Electridae) from true Gobies (family Gobiidae) by the pelvic (ventral) fins. They are separate on the Sleeper Gobies and fused on the true Gobies.

② The difference between the Three-spined Stickleback (*Gasterosteus aculeatus*) and the Ten-spined Stickleback (*Pungitius pungitius*) is 7 spines!

③ The African Knifefish (*Xenomystus nigri*) and the Asian Knifefish (*Notopterus notopterus*) look, at first glance, to be alike. But the Asian fish has a dorsal fin and the African one doesn't.

④ Asian Bagrid Catfish are often confused with the South American Pimelodids (Long-whiskered Catfish). Check the number of barbels: most Bagrids have four pairs (The Giraffe Catfish, *Auchenoglanis occidentalis* is an exception to the rule, it has three pairs of barbels - there's always one, isn't there?!; Pimelodids have three pairs.

NEW SERIES

SHORE WATCH

BY ANDY HORTON

Welcome to **Shore Watch**, a brand new series aimed at all lovers of our native shores and their aquatic wildlife. Every month I will be selecting some of the highlights of what you can expect if you go rockpooling, or simply beachwalking. So, let's kick off straight-away with a special two-page first instal-ment. I hope you enjoy it.

Rocky shores are the most interesting of all our shores, irrespective of time of year. Where the harder rocks of limestone, sandstone and granite have been weathered by the pounding of the waves, creating an intertidal terrain of broken rocks, fissures and gullies, the 'rockpooler' can search these habitats for a host of marine creatures when the tide goes out.

The serious rockpooler is not just a collector. He or she is an explorer and scientific investigator. Why else would anyone venture out on a low spring tide in the bitterly cold month of January?

Just as on land, the marine environment — at least in the temperate (not tropical) seas — has seasons. On most rocky coasts around these islands, January is the most deficient month of the whole year in terms of shore animals.

Why is the fauna so scanty? One answer is fairly obvious, even if you are wrapped up warmly to face the elements. Small rockpools can cool quickly in the freezing temperatures, and it is simply too cold for a lot of the mobile life, like the small rockpool fish, prawns and crabs, which will have migrated off into the warmer sea just offshore in the latter months of the previous year.

Other reasons are not so apparent. Heavy rainfall can dilute the brine, making pools into brackish or freshwater, unsuitable for most of the marine creatures. Occasionally, species that are happy in these conditions, like the familiar Three-spined Stickleback and Mysid Shrimps, can be spotted in clear estuarine pools.

Fucus and bare rocks

Many shores are draped with masses of slippery brown seaweeds known as the wracks. There are several species found attached to rocks on different zones of exposure on the shore.

They have the generic (first) scientific name of *Fucus*. The two commonest species are the Bladder Wrack, which is found on the middle shore and is distinguished by conspicuous air bladders that keep the seaweed erect when the

The Shore Crab — a hardy rockpool resident.

ANDY HORTON

ANDY HORTON

SEA ANEMONES

Sea Anemones are not plants but carnivorous animals with poisonous tentacles (harmless to humans) which catch small creatures and ingest them.

The Beadlet Anemone, is widespread and common on rocky shores. It can be found in varying shades of reds and greens. Out of

ANDY HORTON

LEFT — **Classic rockpool at Ovingdean, near Brighton marina**

ANDY HORTON

The unusual Coat-of-Mail Shell or Chiton.

They may look like plants, but anemones are predatory animals.

The water it will appear like a blob of jelly attached to rocks and groynes (wood breakwaters) often quite high up on the shore. The tentacles flow out gracefully when the anemone is submerged. In winter, they may have dwindled in size because of food shortages.

tide comes in, and the Serrated Wrack, which is found nearer the sea, and can be identified by the tooth-like edge to its fronds.

The edges of the fronds may droop into the pools, but in January the rocks on the bottom of the pools are bare. The more delicate red and green algae will die down in winter, and the spores will not settle to bring new life until the spring.

Jan molluscs

Conical Common Limpets and snail-like Periwinkles will graze on the minute growths of algae, rasping meandering trails. They play an important role in keeping the seaweed in check.

Aggregations of the Common Mussel are permanently fastened by their byssus threads on rocky shores with a sufficient flow of plankton-rich water. Mussels feed on microscopic diatoms by inhaling the seawater and extracting these planktonic plants.

Cockles are inhabitants of sandy areas, buried just below the surface, often in millions, but can be found on rocky shores with sand.

January can be the best time to seek out some of the inconspicuous molluscs. An interesting little creature, which is most easily seen at this time of the year, is the Chiton, or Coat-of-Mail Shell. It looks like a woodlouse without legs.

It sticks as tightly to a rock as a limpet and is difficult to remove without damage. Of several species, the one found on the underside of rocks on the shore is most likely to be *Lepidochitona cinereus*.

Andy Horton will be pleased to answer enquiries from readers if a SAE is enclosed. Please write to:
Andy Horton, British Marine Life Study Society, c/o Aquatic & Pondkeeper, 9 Tufton Street, Ashford, Kent, TN23 1QN

JANUARY CHECKLIST

For most of the length of the British coast, with the possible exception of the south-west, mobile fauna, rockpool fish, crabs and other invertebrates of interest to the aquarist are notably absent during the first few weeks of the year.

When the sun manages to penetrate the clouds, we might tentatively venture on to the shore, if only to collect live food, mussels, cockles etc. to feed to the fish and crabs collected in the previous year.

The rockpooler can only expect to find the permanent residents of the rocky shore this month; animals and seaweeds so hardy that they can survive the harsh conditions of the shore in January. Common animals that can be expected include:

Molluscs

Common Limpet	*Patella vulgata* 1
Mussel	*Mytilus edulis* 2
Cockle	*Cerastoderma edule*
Periwinkle	*Littorina littorea* 3
Flat Winkle	*Littorina obtusata*
Chiton	*Lepidochitona cinerea*
Grey Topshell	*Gibbula cineraria*
Thick Topshell	*Monodonta turbinata* 4

Sea Anemones

Beadlet Anemone	*Actinia equina*
Daisy Anemone	*Cerius pedunculatus* 4
Sea Anemone	*Sagartia troglodytes*

Seaweeds

Bladder Wrack	*Fucus vesiculosus*
Serrated Wrack	*Fucus serratus*

Crabs

Shore Crab	*Carcinus maenas*
Hairy Porcelain Crab	*Porcellana platycheles*
Long-clawed Porcelain Crab	*Pisidia longicornis*
Pea Crab	*Pinnotheres pisum* 5

1 There are two other species of *Patella* limpet found on south-western shores.
2 The Horse Mussel or Clabachdubh, *Modiolus*, is found on Scottish and Irish shores.
3 Other species are winkles present on south-western shores.
4 Found on south-western shores only.
5 Female lives inside the shells of mussels and other bivalves.

JANUARY BRITISH SEA TEMPERATURES (SURFACE, INSHORE)

	ºC	ºF
Thurso North Scotland	6.7	44
Newcastle	5.6	42
Donegal	8.9	48
Brighton	7.8	46
Plymouth	8.9	48
Gibraltar	14.4	58

NEWS

A&P contributor joins élite

One of Jack's numerous 'powerful' close-ups of Sharks.

JACK JACKSON

A&P contributor **Jack Jackson** has joined the élite of his profession with the award of a highly coveted Fellowship of the Royal Photographic Society. Jack has been a regular article and photographic contributor to *A&P* over a number of years and his feature articles have incorporated some stunning underwater photography.

Also a travel author and now, award-winning photographer, Jack has recently finished writing two books entitled *Dive Sites of Malaysia and Singapore* and *Dive Sites of the Philippines*. He has also made more than 150 expeditions in deserts, mountains, rainforests and seas around the world, including 23 in the Sahara Desert, driving several four-wheel-drive vehicles. In addition, he has published a number of books on four-wheel-drive vehicles and their use off-road and on expeditions.

Jack's works are published regularly in major books, newspapers and other publications worldwide. Among his contributions to *A&P* have been articles on dolphins, sharks, coral reefs at night and, starting this month, a two-part report on the turtles of Malaysia with (of course!) some rather special pictures.

All of us at *A&P* offer Jack our sincerest congratulations on his very special award and look forward to receiving even more of his spectacular, breathtaking offerings.

ABDULLAH HAFIZ

Jack Jackson getting ready for action in the Philippines.

Coral Reef's tank-bred marines

Over 200 tank-bred Tomato Clown Fish (*Amphiprion frenatus*) and Common Clown (*A. ocellaris*) were exhibited by **Coral Reef Technology** at The Supreme Festival of Fishkeeping, Weston-super-Mare, in November — the first time such Israeli-bred stocks have been seen in the UK.

According to **Paul Davies** of Coral Reef Technology, the fish, from **Red Sea Fish pHarm** hatchery in Eilat, Israel, represent the first tangible results of two years' research and development by a dedicated team of marine biologists. Paul added that, by the middle of this year, over 15 species will be added to the species available on a continuing basis at Coral Reef Technology's **Reef Life Centre.**

These species include the Red Sea Two-banded Clown (*A. bicinctus*), the Marine Betta (*Calloplesiops altivelis*), The Sunrise Dottyback (*Pseudochromis flavivertex*) and *P. fridmani*, the orchid or Fridman's Dottyback.

Further details from **Paul Davies, Coral Reef Technology, 62 High Road, Byfleet, Surrey KT14 7QL. Tel: 01932 355121; Fax: 01932 349718.**

CORAL WORLD — EILAT

Fridman's Dottyback — now being bred in captivity in Israel.

FBAS improves FADS

The **Federation of British Aquatic Societies (FBAS)** has improved its **Federation Approved Dealer Scheme** by limiting participation to just 100 premises.

The scheme will operate in much the same way as the **Dwaler Discount Scheme,** whereby retailers signify their willingness to provide discounts to FBAS members by displaying a FBAS sticker in their window. Explained a FBAS spokesman: "The revised scheme is designed to dispel any illusion that such premises might be considered 'cheap rate' in quality, as well as in price, so the scheme has been given a more positive look to help ensure that quality is upheld."

He explained that premises registered with FADS will be expected to provide clean facilities, healthy stock, a comprehensive range of goods and knowledgeable staff.

"Customers should appreciate that fish and plant stocks vary from area to area, but the overall impression should be that of competence. With regard to the actual discount provided, this is left entirely to the discretion of the premises manager."

INTRODUCING:

4 FRIENDLY

Max Gibbs of the Goldfish Bowl in Oxford, introduces some gentle, 'all-consuming' giants for the dedicated marine aquarist.

Photographs by the author

The Long-finned Batfish is well named!

They are delightful as juveniles. You will see them grow by the day. You'll then despair at the prospect of rehousing the adults. They are Batfish of the genus *Platax*! Embraced by the family Ephippidae (formerly Ephippididae) and also earlier considered exclusive to the subfamily Platacinae, there are four species of Batfish. Three species are frequently available to the marine fishkeeper; one other may be rarely offered.

The Roundfin Batfish (*Platax orbicularis*), the Long-finned Batfish (*P. tiera*), and the Red-faced Batfish (*P. pinnatus*) are the three 'regulars'. The more unusual 'bat' is the Batavian Batfish (*P. batavianus*), putting in only an occasional appearance.

If you are fortunate enough to dive or snorkel in tropical Indo-Pacific seas, you may well find huge mature batfish inquisitively ogling at you. In touristy areas, where organised visits of holidaymakers are made daily, large specimens are often among the many species waiting to bustle in to take food offered by human hands. They will have lost the decorative finnage and juvenile colours, but remain endearingly friendly and possess 'knowing', expressionate faces.

1 Roundfin Batfish

P. orbicularis is the species most commonly imported for the fishkeeper. Specimens may arrive with a body no bigger than a finger nail, having elongated dorsal and anal fins and resulting in an overall form which is eliptical in shape.

The colour can vary from a light ochre-yellow, to rich chestnut-brown. Circular white rings and spots may speckle the body. The rate of growth is phenomenal, and baby batfish seem to be eternally hungry!

As juveniles in the wild, it is not unusual to find specimens in very shallow water at the tideline. This is usually in mangrove-fringed areas of shoreline. The water depth will be insufficient for them to swim in an upright position, and they just drift on their sides, blending remarkably with dead mangrove leaves.

This convincing mimicry enables juvenile 'bats' to drift up to their prey without arousing suspicion. If disturbed, they will skim off to deeper water, assuming an upright posture as soon as possible.

At this very young age batfish appear to function as individuals, but at a rather more mature stage in their development, they are often encountered in two's staying close to one another and moving as if in unison.

2 Longfinned Batfish

The elegant *P. tiera*, like its round-finned cousin, is easy to keep and is another rapid developer. Young specimens are collected at a somewhat larger size, generally, than the Roundfins.

The extreme length of the dorsal and anal fins gives an overall impression of a greater size than is the actual case. Observing the body as a separate unit puts the true size into perspective.

The pelvic (ventral) fins are also an exaggerated length in the juveniles, but all long finnage gradually shortens with maturity, leaving the adults looking very similar to other mature batfish species — large, laterally compressed disc-like bodies, fringed by stocky short finnage, and a bland unexciting silvery-brown colour with indistinct vertical dark bar markings.

3 Red-faced Batfish

P. pinnatus is stunningly beautiful as a juvenile. The overall base colour can be almost jet-black, although it is more often a subtle combination of darkest browns. The fullness of the finnage is sail-like, with both dorsal and anal fins being greatly elongated, resulting in a flambuoyant effect. As in the Long-finned Batfish, the ▶

BELOW LEFT **—Juvenile Roundfin Batfish resemble a dead leaf in coloration and markings.**
BELOW RIGHT **— Mature Rounfins lose much of their juvenile coloration.**

BATS

Baby Red-faced Batfish (no longer than a fingernail!). The theory goes that, at this size, this species mimics a toxic polyclad flatworm.

As the Round-faced Bat grows, its fins elongate and its colours begin to change.

BATFISH FACT FILE

Platax pinnatus has requirements often so different to those of the other three species that it almost needs to be separated from them for the purpose of compiling the following information. However, the species is given individual mention where necessary under the general headings.

1 AQUARIUM: Probably best thought of in terms of 'public aquarium'-type LARGE aquarium when relating to mature fish of some 50cm (c20in) in length (or diameter?)

2 HARDINESS: *P. pinnatus* is particular about diet and water chemistry. Accordingly, it should be regarded as 'difficult'. The other three species, by contrast, are distinctly more accommodating and 'easy'.

3 COMPATIBILITY: Usually, batfish are gentle giants with tank companions, although they may bicker among themselves. *P. pinnatus* will not tolerate constant worrying from others, and can stress and die if aggravated.

4 FEEDING: *P. pinnatus* needs coaxing to adapt to captive feeding. Small live foods are usually relished, but some frozen foods may be readily taken also. A choosy, sedate feeder. The others — voracious! They accept a wide range of foods avidly and need regular copious feeds to satisfy their needs.

5 FILTER MATURITY: Because of the heavy feeding requirements, the waste excreted is similarly considerable. Therefore, a well established aquarium with a fully matured filtering system is essential for well grown fish, but less critical for small juveniles. A largely unfluctuating water chemistry is desirable, if not essential, for *pinnatus*, and a well established environment is called for, regardless of the size of the fish.

6 TEMPERATURE RANGE: A 'warm' 26°C (79°F) is ideal. (You guessed it! — *pinnatus* is more particular about this item than the others).

7 WATER DENSITY: Any specific gravity reading within the normally acceptable range of 1.020 to 1.024 is suitable. (A lower range of 1.018 to 1.020 is recommended by one Filipino dealer with long experience).

8 SPECIAL CONSIDERATIONS: Should you buy a batfish? The charming babies grow to be very large fish. Can you accommodate the adult fish? Although becoming disarmingly tame, the adults lack the lovely form and markings of the juveniles. Can you continue to love and enthuse over the bland adults?

4 FRIENDLY BATS

The rarely seen Batavian Batfish.

◀ pelvic fins are also sweeping and long.

Seen in profile, the entire dark form of the fish is highlighted by a halo of fiery red. The effect is magnificent. The theory is that the form and markings of juvenile specimens mimic a toxic and foul-tasting polyclad flatworm. It is difficult to appreciate the validity of this conclusion until you have the joy of seeing the baby stage of *P. pinnatus*. Most certainly, at that tiny size, the likeness is clearly seen.

The Red-faced Batfish is nothing like the two previously mentioned species as far as hardiness is concerned. While its relatives consume anything and everything, the Red-face is a finnicky feeder, preferring small live foods and having to be trained to adapt to more convenient diets.

It also requires perfect water conditions, being unable to cope with some environmental parameters apparently tolerated quite well by the two hardier relatives. If the fine finnage becomes damaged other than superficially, there may also be serious consequences for the Red-faced Bats, whereas Roundfin and Long-finned Bats can normally regenerate such damage without trouble.

4 Batavian Batfish

In many years of fishkeeping and dealing, I have had experience of many specimens of the above three species of batfish, but the Batavian Batfish (*P. batavianus*) has only come my way once.

It was a delightful juvenile of no more than 2 inches (5cm) in height. On acquiring it, there was some damage to the anal fin, with quite an area of tissue missing. Within two weeks, the fish had grown half as big again, and the fin damage had mended and regrown perfectly.

Stylish finnage, once again, embellishes this lovely batfish, but the unusual etched markings covering its entire form set it apart from the other species described above.

My specimen appeared to be quite as hardy and voracious as the Roundfin Bat!

The adult form of this fish has a more elongated shape than the almost-circular profile of the other three species. It also tends to be a lighter, silvery colour.

Friendly giants

Whichever species of batfish you might choose to keep, you will surely be rewarded by the natural friendliness of these gentle giants.

Their readily learned recognition of the human friend who feeds and cares for them manifests itself in the way they respond to physical contact, rising to the water's surface to be petted. Rather than being simply a gimmick, hand-feeding — in this case — helps to cement this bond and trust between human and fish. A great experience!

Fish Fayre 95

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KOI TALK

by Alan Rogers

Be a boy scout

The motto of all boy scouts is "Be Prepared", and perhaps all fishkeepers should adopt this very important proverb when it comes to emergency treatments to our Koi.

Many of you write to the magazine when confronted with a sudden disaster or sick Koi asking "What can I do"? .... The simple answer to this is, NOTHING. If you have nothing readily to hand in a crisis, it is obvious and clearly speaks for itself: there is very little you *can* do to help a sick fish!

To those hobbyists who enjoy the luxury of a purpose-built fish house with all the back-up support necessary, I apologise for going over familiar territory, but I'm sure you will agree with me that this aspect of the hobby is of the utmost importance to the newcomer. Even the most advanced hobbyist will, at some time, be faced with a crisis situation.

In my last **Koi Talk**, I spoke briefly about containers/tanks which were suitable for temporary medication and treatment facilities. Avoid square containers, as the corners are always a source of damage to mouths/noses and finnage.

Purchase a good-size round plastic or polypropylene water tank, readily available from most good builders' merchants. These are available in 50 gal., 75 gal. and 100 gal. sizes; you would need to purchase the size suited to the largest Koi in your pond. Generally, the larger the tank, the better for long term investment. I can assure you it will be the wisest choice in time, as your Koi decide to grow on you. (Pun intended!)

Some useful tips

① Fill the tank slowly and measure the volume of water you are putting in precisely in gallons, marking a permanent dipstick in increments of 10 gallons. This will enable you to assess the volume of water at all times for accurate administration of medication.

② It is not necessary to fill the tank to the top. Indeed, it would be advantageous to only half fill it, as this will have the advantage of allowing you to reduce the amount of medication, reduce the volume of water which requires heating and, most important of all, prevent an energetic Koi leaving the confines of the treatment tank if it should decide to jump out! Better still, cover the tank as a safety precaution.

③ Koi, under all forms of treatment, will require endless amounts of aeration for healthy survival in this container, so a good-quality aeration pump with one or two large ball-type air stones should be next on the priority list.

④ Stabilising and controlling water temperature is a key factor in rapidly healing damaged tissues and fast remedial recovery back to normal health. Many treatments are only effective when applied at temperatures over 60°F (20°C).

⑤ For the more adventurous hobbyist, two such set ups would give longer term treatments, by allowing you to carry out total or partial water changes in one, while the patient is still being treated in the other. By maintaining equal water temperatures in both tanks, the Koi can be transferred without undue stress into clean, unmedicated water.

Remember, these tanks are for treatment only, and aeration is provided without the benefit of filtration. Therefore, under these conditions, rapid water quality deterioration will occur, and feeding must never be offered while the Koi are in medication. Partial water changes are, consequently, paramount for water quality to be maintained.

In addition to having containers and tanks for temporary medication, a floating basket is useful for close-up examination of Koi.

ALAN ROGERS

Important heat

The effect temperature has on the healing process of all external damaged tissues and internal disorders must never be underestimated.

For instance, an ulcerated lesion will take approximately 8 weeks or more to regenerate new skin at 54°F (12°C), whereas at 72°F (22°C) or higher will generate in 7 days, and probably be totally regenerated in 15 days. The faster an open lesion heals over, the less likelihood are the possibilities of further bacterial infection developing through the same wound.

Costia is a parasite, which gives a white appearance or sheen on the bodies of Koi which have been chilled or subjected to long spells of excessively cold temperatures. This can be remedied quickly by using a gentle heat treatment therapy, with the addition of potassium permanganate at 1.5 grams to 220 gals of water.

Bacterial infections will ultimately have to be treated with antibiotics, once the strain of bacteria has been correctly identified. Often, erroneous use of antibiotics by Koi keepers has resulted in the production of resistant strains of water-borne bacteria. The application of antibiotics in temperatures less than 60°F (15.5°C) would be highly improbable in accomplishing an acceptable cure. Indeed, temperatures of 68°F (20°C) and over, are far more likely to give successful results.

Antibiotics, rightly so, are only available through a registered veterinary practice and should be used only as a curative in the hands of a knowledgeable and experienced person.

It should be quite apparent by now that the administering of heat to numerous medications has many advantages in accomplishing a speedy recovery.

ALAN ROGERS

ALAN ROGERS

Top, Temperature will affect the rate at which damaged tissue will repair. Here, a new layer of epidermis (skin) is developing over an open lesion.
Above, Transferring treated fish from the shelter of an indoor heated 'hospital' pond to outdoor quarters during the ravages of a British winter is fraught with problems.

Turning up the heat and controlling a curative temperature is not the problem. The difficulty arises when, having remedied the ailment, the temperature must be gently reduced to that of the outside pool. This is an immense problem if the convalescent period just happens to coincide with the ravages of a British winter.

It would be a great setback on the road to recovery, if the returning Koi was subjected to rapid and unfavourable temperature differences. Often, in severe weather conditions, it would be vital to wait for an appropriate time to return the Koi, and it might be at this time when the two-tank set-up assumes a new importance.

Balanced approach

Most pond dosages are usually rated per ton of water (220 gallons) or to 1,000 gallons. Weighing out small dosages for your 50-gallon treatment tank can create its own problems on this basis. An important part of the "equipment support facilities" therefore must be an accurate set of balance scales weighing in grams and, if possible, half gram units as well.

Only a fool will guess weight and quantity in such a small volume of water; the consequences could be disastrous. Never attempt to exceed prescribed dosage rates; most of them have been tried and tested over a decent period of time, with acceptable results. A reliable set of scales will cost little more than the average price most people pay for a good-grade Koi.

Microscopic investment

Perhaps the ultimate piece of equipment any Koi keeper should have in the treatment house is a microscope. Ten years ago, only the élite in the hobby would have claims to such a piece of equipment, but, happily, I can report today that many comparative newcomers to the hobby have made wise investments with a microscope.

Being able to SEE and RECOGNISE specific parasites on your Koi, immediately gives you the edge in controlling any parasitic outbreaks by taking the correct evasive action.

A good basic microscope, giving two or three choices of magnification, is certainly not expensive and, with a little practice, anyone can become familiar with its operation and benefits in a very short time.

It's amazing what little gems of equipment can be picked up at car boot sales and fêtes but, more importantly, aways ... "Be Prepared".

Talk to you soon.

What is hanatsuki?

A type of pattern. It is the Hi(red) pattern on the head which reaches down to the mouth without a break.

A stunning Hanatsuki Sanke.

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THE COMPETITION

Read the AAS Story and then answer the following three questions. Write your answers on a postcard or stuck down envelope (Read the Rules!) and send it to reach us by 31 January '95 at the very latest.

1) In what county of England is the Aquarian brand of fish foods manufactured?

2) Which of the two Davids has been with the AAS for 20 years?

3) Based on the total number of letters handled by the Aquarian Advisory Service over the last 20 years, what is the average number of letters received per year?

The AAS stand is well known at shows throughout the UK.

THE AAS STORY

When the **Aquarian** brand of fish foods and remedies was launched from its West Yorkshire base in 1975, it was decided that a back-up service was needed. This was not just to promote the brand. Rather, it was realised that to keep people interested in the pastime — and so retain customers — advice was needed to help them enjoy their hobby.

To bring new people into the hobby, clear and simple, but informative, guides were required (20 years ago most aquarist books were encyclopaedic and often rather technical). This meant a total information service was needed at the launch of the **Aquarian** range — and so the **Aquarian Advisory Service (AAS)** was born.

Any fishkeeper, aquarist or pondkeeper, hobbyis or trader, could write to the **AAS** at a PO Box for free help and advice. The address was added to all the **Aquarian** products and included in all the advertising and promotional publications. In addition, the **AAS** published **Beginners' Guides,** plus information leaflets, audio tapes and videos.

The **AAS** consultants visited the aquarist clubs to lecture on some aspect of the hobby, with no fees or expenses. Informative articles on fishkeeping were written for many magazines and books, including regular contributions to ***Aquarist & Pondkeeper.*** An **AAS** stand was, and still is, taken to every major fish show.

The amount of work completed in the last 20 years is amazing. Consultants such as **Dr David Sands,** with the founder, **Dr David Ford,** have published many books, articles and bulletins for the **AAS.**

International network

AAS consultants have appeared on TV in the UK and USA and all the radio programmes, from *Woman's Hour* to *Gardener's Time.* The service has also installed aquariums in soap opera sets, including *Coronation Street, Brookside, Children's Ward,* even in a film (*Leon the Pig Farmer*).

The **Advisory Service** stand has been taken to many shows, other than fishkeeping ones, to help 'spread the word'. It has appeared in the Ideal Home Exhibition and The Pet Show. The **Service** has also represented the **Aquarian** brand at many trade exhibitions in the UK, and in New York, Paris, Nürnberg, Singapore and Tokyo.

It has become international, too. The president of the Spanish Aquarist Clubs, **Pablo Sichers,** runs the **Aquarian Servicio de Asistencia,** and, in the Benelux countries, the **Aquarian Advies Service** is managed by **Rien van Dam.** In the USA it is **Ed Taylor,** a fish judge and quaticauthor, who runs the **American AAS.**

Dr David Ford, the 'founder member' of the AAS, lecturing at the famous Church Street Station in Orlando, Florida.

THE PRIZES

20 lucky winners will each receive an engraved pen (worth nearly £20) and a gift pack of Aquarian products.

One overall winner will be drawn from the list of 20, and this lucky entrant will 'win' the AAS expert Dr David Ford! He will visit you, discuss your plans for a special aquarium for your home, and arrange its manufacture and installation, all paid for by Aquarian.

This super prize, plus the 20 gift packs, add up to a retail value of at least £1,000 — a suitable commemoration of 20 years of service to the hobby!

1000,000 Problems

David Ford estimates that he has answered 100,000 letters since the **AAS** was launched 20 years ago. The letters arrive at the PO Box in Yorkshire where staff open and read each one. If a request for basic information is made, a **Beginners' Guide** pack is posted by return, but if there is a specific problem, this is personally answered by David on a 486 Multimedia Computer. This is also connected to Compuserve, so e-mail and Internet queries can also be tackled. In an emergency, a telephone help-line is manned by **David Sands** (on **0772 30869**).

To celebrate the 20 years' anniversary of the launch of **AAS, Aquarian** are sponsoring a series of lectures at public aquaria in the UK. The two Davids will each give talks on nutrition and on husbandry of petfish to invited aquarist club members, including free entry to the aquarium. Each guest will also receive a commemorative gift.

Club secretaries will be contacted soon. Meanwhile, the commemorative pack could be yours . . . just enter our easy competition!

THE RULES

1. Write your answers to the competition questions on a postcard or stuck-down envelope.
2. Write your FULL name, i.e. including full first name and address, in BLOCK CAPITALS on your entry.
3. Send your completed entry to: AQUARIAN 20th ANNIVERSARY COMPETITION, Aquarist & Pondkeeper, Dog World Ltd, 9 Tufton Street, Ashford, Kent, TN23 1QN.
4. Closing date: entries must be received by 31 January 1995, at the latest.
5. Only ONE entry per household will be accepted.
6. Entrants must be over 18 years of age.
7. No correspondence will be entered into regarding the competition.
8. The judges' decision will be final.
9. No responsibility is accepted for entries lost, delayed or damaged in the post, and proof of posting will not be accepted as proof of delivery.
10. The 20 prizes will be awarded in order to the first 20 correct entries drawn at the end of the competition.
11. The top winner will be the first card drawn from the above 20.
12. No cash alternatives will be given.
13. The winners' names will be announced in the April 1995 issue of *Aquarist & Pondkeeper*.
14. This competition is open to all residents of the UK, excluding employees and families of Aquarist & Pondkeeper, Dog World Ltd., Pet Business World, Aquarian and their agencies.

COLDWATER JOTTINGS

BY STEPHEN J. SMITH

What to do in winter

What does the coldwater fishkeeper do in the winter months, when the pond fish are dormant (and it's too cold to go outside anyway)? Well, in addition to curling up in front of the fire and reading your latest issue of *A&P*, there is a great deal which you can do to enjoy and expand your interest in coldwater fishkeeping.

For 'coldwater' perhaps we should substitute the word 'temperate', especially when you consider that the majority of 'coldwater' fish imported into the UK come from tropical climates!

There is more to coldwater, too, than keeping Goldfish or Koi in ponds. Much of the pleasure I derive from the hobby stems from keeping a magnificent Blue Oranda in an aquarium in my living-room, and I well-remember a pair of Fancy Goldfish spawning one New Years Day! In addition, many enthusiasts keep the majority of their fish in tanks housed in specially-constructed 'fish-houses' which serve extremely well during the winter.

STEPHEN SMITH

The Bubble-eye is one of several varieties of Fancy Goldfish which fare better in indoor aquaria.

For the average fishkeeper, the Fancy Goldfish varieties are tailor-made for indoor aquaria. Their round bodies and (generally) long finnage are better viewed from the side. Indeed, the long-finned varieties, such as the Moor, Oranda and Veiltail, are better kept and viewed in indoor tanks, while Lionheads and Bubble-eyes also fare better for being kept in indoor aquaria, with the latter probably being better viewed from above.

You don't need to restrict yourself to Goldfish, either, when there are several 'temperate' species to go for, and which make equally attractive indoor aquarium inhabitants. Red Shiners, Minnows (of several varieties), and even Mollies, Guppies and Barbs, are just a few examples of fish which can be kept in unheated 'ambient' aquarium conditions, especially if your living room has central heating.

So, once you've consumed the last of the Christmas turkey sandwiches and shaken the few remaining needles off the Christmas tree, how about getting out of the armchair, popping along to your local aquatic centre, and embarking on setting up a coldwater aquarium with a difference?

Do let me know about your own version of the indoor coldwater hobby, and of the fish you enjoy during the winter. Just drop me a line **c/o Coldwater Jottings, A&P, 9 Tufton Street, Ashford, Kent, TN23 1QN**

NGPS at BAF '94

If you didn't attend the **British Aquarist Festival** towards the end of last season, you missed some great coldwater fish (see **Out and About** elsewhere in this issue of **A&P** for a full report on the show). Not only was there a magnificent-looking Sterlet on display as part of the Champion of Champions competition, but I was delighted to see **Northern Goldfish and Pondkeepers Society** present throughout the show with a society display from which visitors could receive information about the society, as well as chat to members about their interest in coldwater fishkeeping.

It gave me also the opportunity to chat with a regular correspondent to **Coldwater Jottings, Alan Ratcliffe**. Alan is a member of NGPS and he was able to update me on the latest news with regard to a debate which has appeared regularly within these columns, with regard to specialist Goldfish and coldwater clubs showing at 'tropical' society shows.

For those who are not familiar with this debate, it has been one of my observations that rarely do specialist Goldfish societies appear to show their fish at those competitions organised by the more 'general' areas of the hobby. So I was delighted to hear Alan's news that NGPS has received a positive response from **FBAS (Federation of British Aquatic Societies)** and **FNAS (Federation of Northern Aquarium Societies)** about this very subject, and that bridges are being built to develop a greater understanding of hobbyists' differing points of view.

SOAPBOX

SAFETY AROUND THE POND

The fascination of water is a lure that few children can resist. And why should they, when there is a whole new world of fish, bugs, and plants below the water, just waiting to be explored? So, every garden should have a pond — if only for the children!

However, water can be dangerous, especially for very young children. So, please, while I believe that children should be encouraged to take an interest in waterlife, do make sure that you supervise them AT ALL TIMES.

Happily, incidents involving children being injured, or worse, with the garden pond are few and far between. But only one injury or fatality is one too many, so supervision is paramount where children and ponds are concerned.

Further measures can be taken to ensure the safety of your pond. I would always advise that a pond is built so that the water level is raised above ground, as in the picture of my own Koi pond; while rustic poles or a hedge can be used to form an attractive fence or barrier around the pond area.

Supervision is also essential if you decide to go 'pond dipping'. Such an activity causes much excitement among children and is a wonderful way to spend a sunny afternoon in your local countryside. But, again, please do keep very close tabs on the children. Preferably, each child should be accompanied by an adult. Have fun, and be safe!

PHOTO JOTTING

Looking back at summer

It seems so long ago that we were basking in the heat of what was one of the finest summers in the UK for some years, and one during which we could really enjoy our outdoor hobby to its fullest extent. The highlight for me was some remarkable growth of my Koi and some highly-successful spawnings of Fancy Goldfish (now sorted and tucked up in gently-heated indoor aquaria).

However, the start of such a tremendous season, for me, was when I took myself off to visit Koi and coldwater fish farms in Israel. This picture is one of my most enduring images of an endearing landscape, and shows a magnificent view across the Sea of Galilee.

The shot was taken during my research trip to fish farms in Israel last year (see *The Land of Promise, A&P* August 1994).

Let's hope it won't be long before we can shake off the winter frost and plan our next trip. Until then, I'm staying put beside the fire, to glow in the memories of the past fishkeeping season . . . !

Standards update

Some readers of **Coldwater Jottings** may remember that this column warmly welcomed news, several years ago, that the specialist Goldfish societies were to get together to produce nationwide standards for showing Fancy Goldfish. At last, I have heard through the grapevine (though I have received no 'official' notification) that those standards have been agreed by the respective Goldfish societies involved in the project, and that the first publication of the nationwide standards book will be sometime this year.

Hopefully, it won't be too long before we will see those standards adopted by the major tropical societies, such as **FBAS, FNAS** and **A of A (Association of Aquarists)**.

Things have obviously progressed a great deal over recent years, but the next step is down to you, the coldwater hobbyist and Goldfish specialist. With the introduction of national standards comes the need for people to judge the fish using these standards, and it is a fact of life that there are very few specialist Goldfish judges available.

So, whatever your interest in Goldfish, how about putting your name forward to become a judge? Any of the major societies mentioned will be more than pleased to give you guidance in the new standards and in judging fish, and there are no age limits. Therefore, whether you are seven or 70, how about giving it a go?

And finally

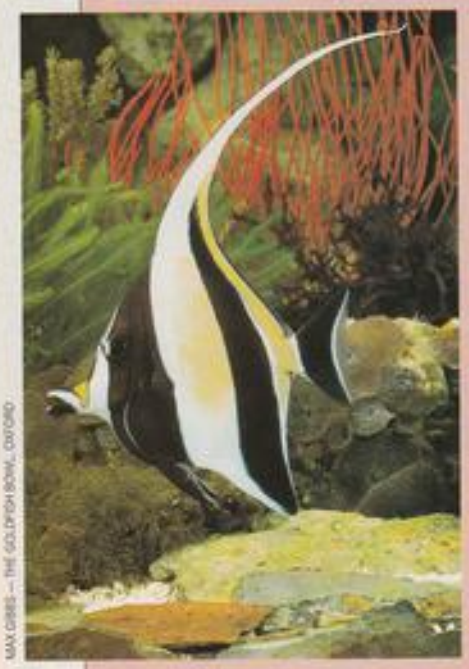
A very happy, healthy and successful fishkeeping New Year to all!

QUESTION TIME

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

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

MARINE



MAX GIBBS – THE GOLDFISH BOWL, OXFORD

Moorish Idol: give it adequate conditions, and it should do well.

Idol worship

I have always adored the Moorish Idol, but been put off keeping one because everything I've read says that they are the most difficult species of the lot. What do you think?

If you are an experienced aquarist and you can provide the correct environment, then there is no reason why you shouldn't keep a Moorish Idol succesfully — provided, of course, that you can find one!

You should remember that this species is related to surgeons and tangs and, as such, is a vegetarian. This means that there should be an abundance of algae in the aquarium. What there should NOT be in there are any boisterous species.

High-rise water

I keep a large aquarium and appreciate fully the importance of regular, partial water changes. However, my water supply is two floors above the tank, and I'm not a big bloke. Got any ideas?

Sure! Prepare your new water in the normal way, upstairs, then simply siphon it into the aquarium using common or garden airline.

Believe me, this method works very well.

PLANTS

Backward-growing soldiers

Last season, I bought two Water Soldiers and placed them in my pool. However, they turned upside down and developed a peculiar shape, with the leaves growing backwards. What can I do if this happens again this year?

Water Soldiers (*Stratiotes aloides*), when established, produce a long root from the underside of the crown. This grows down into the bottom mud, where it divides and becomes an anchor. The plant is therefore suspended in the water in the manner of a buoy.

When harvested and sold, this root is often snapped off, or young plants produced as runners by the old mother plants, are simply removed.

Although the plant initially floats upside down during the first season, it will right itself when growth commences again in the spring.

CO_2 refills

I recently purchased a carbon dioxide cylinder from a shop that was closing down. It was brand new, but I now find that the cylinder is empty. Where can I get it refilled?

These gas cylinders are imported from Germany by air and air traffic regulations prohibit the carriage of filled cylinders for safety reasons. However, your local fire extinguisher company will normally refill cylinders. The charge varies from £2.00 to £5.00.

Properly grown healthy Water Soldiers.

KOI

Wood (as shown in this photograph of Anglo Aquarium's pond at the '94 Hampton show) can be used to very good effect in ponds, with adequate precautions, of course.

Timber treatment

A number of publications, including your own, have occasionally shown areas of timber boarding adjoining/overhanging the pond edge, and we have decided to incorporate this across one end of our Koi pond, adjoining the fence.

The construction itself is not difficult. However, our question concerns the final treatment to the timber, bearing in mind that rain could wash whatever finish we use directly into the pond. We would welcome your views on this.

Your question regarding timber preservative is an interesting one. Originally, this idea was conceived in early Japan, where the design of log piling around the edges of ponds and lakes was intended to prevent soil erosion into the water. This practice still takes place, and the timber is usually dipped into a wood preservative, usually tar-based, before being driven into the mud.

In Koi ponds, however, a different approach has to be considered for reasons of toxicity to the fish therein.

Any good wood preservative that is not oil-based would be acceptable, but would take months of curing before it could be submerged.

A more recent practice, after initial drying and rinsing, would be to cover all logs (beneath surface level, particularly) with either G4 resin coat, or with pond-grade fibre glass resin. A couple of coats would preserve the logs for many years. Although time-consuming and initially expensive, you would certainly benefit in the long run.

I have seen logs treated in this way 10 years ago, still in healthy service.

I have also seen non-treated timber give good service of 5-7 years with a slow deterioration taking place and no ill effect to the Koi, but I would still advocate my former suggestion.

HERPETOLOGY

Lighting, pros and cons

Would you please explain the difference between incandescent and flourescent lighting and their pros and cons with regard to their use in a vivarium which accommodates reptiles?

Incandescent bulbs contain a filament of very thin wire which has a high resistance. The wire is usually made of tungsten. The high electrical resistance of this wire results in the production of both **light** and **heat**.

Due to the emission of light and warmth, a silvered spotlamp can be used during the day to create a basking 'hot spot'. However, to avoid stress, the spotlamp **should not** be connected to a conventional thermostat which quickly breaks the electric circuit and causes the light to flash on and off intermittently. Some modern vivarium controllers incorporate a dimming device which reduces this dramatic and stressful effect.

Even using a dimmer, an incandescent lamp should not be used to provide the **background** warmth for reptiles maintained in an indoor vivarium - an alternative heat source must be installed.

Although a conventional thermostat should not be connected in circuit with any form of lighting, it is advisable to control the basking spotlight by a time-switch. This will establish a regular day and night lighting cycle for the reptile in the vivarium.

Unfortunately, tungsten filament incandescent bulbs do not emit ultra-violet (UV) rays. These are present in natural sunlight and are very beneficial to reptiles for the maintenance of health and vivid body coloration.

Ultra-violet can be provided for reptiles during the day by using specific types of flourescent tube. One example is the aptly named True-Lite (known as Vita-Lite in the US). It is available as either a standard tube or with a 'Power Twist' which increases the surface area and is claimed to emit approximately 10% more light than a standard tube using the same amount of electrical power.

Alternatively, a Blacklight tube could be used. This type of tube has black glass and therefore emits no visible light, only ultra-violet.

Glass in windows and in the sides of a vivarium filters the UV wavelengths out of natural sunlight and it will do the same with the UV rays emitted from flourescent tubes. Therefore, flourescent tubes used to provide ultra-violet must be fitted **inside** the vivarium to be of practical benefit.

All types of light-emitting flourescent tube should also be turned off at night-time to establish a day and night behaviour pattern among the inhabitants of the vivarium.

A spot tungsten-based lamp and a 'power twist' type of flourescent tube. Both are suitable for use in vivaria. JULIAN SIMS

COLDWATER

Snails a good idea?

Last year, I built my first garden pond and all went well, with the fish settling in and the plants growing and having established themselves.

A neighbour has now advised me to introduce some pond snails to maintain a good balance within the pond. Is this really a good idea?

Snails do have their place in natural waters, but I prefer not to have them in my ponds. They eat plants and add to the list of culprits responsible for pond pollution. I certainly would not recommend that you introduced them into your pond.

Mixed Shubunkins

This year my Shubunkins bred in my pond. I have several young fish which have grown very well, but few are as colourful as their parents. In fact, they appear to be a very mixed bunch.

Could this be because the adults are not from good-quality stock?

They were originally purchased from my local aquatic shop.

From a cross between Nacreous x Nacreous fish as your Shubunkins, you can, in theory, expect to have 50% nacreous fish of varying depth of colour, 25% matt, which have little or no pigmentation in their skin and black button-like eyes, 25% metallic-scaled fish which have scale colour as the wild type goldfish.

Some of these may eventually change to orange, though they usually take a long time to do so. This should help explain why you have such a mixed bag of colours in your young fish.

Only about 50% of the offspring from Shubunkin crosses (this is a London type) are like their parents.

PAULINE HODGKIN

TROPICAL

The Black Neon is a good community fish which should be kept in a group.

Black Neon search

I have two Black Neons in my community tank but can't find anything on them in my aquarium books despite repeated searches.

Please give me some basic details regarding the species.

The Black Neon is *Hyphessobrycon herbertaxelrodi*, which should be listed in most encyclopaedia books. However, there are no fewer than 37 ornamental tropicals called 'Black' in the FBAS standards, so it may get overlooked in some books.

The species is a tropical tetra from South America. It is peaceful and a good community fish. However, if you want to breed the fish, the water is critical. It must be peaty acid, yet not too soft: pH 6.0 at 100 ppm. The gravel base should be black, with low lighting and a strong water flow via a pump.

The Black Neon takes flake foods and likes to shoal, so do get several specimens.

Disappearing fish

Two of my fish have vanished into thin air (or water!) following a tank clean-out. How can this be?

It is fairly common for fish to disappear completely, but investigations usually show two possible reasons.

One is that a fish jumps out (even the tiniest of holes can allow an active fish to escape) and a dried-up body is often found when the aquarium and stand are moved at some future time.

Another is that the fish dies (a true pair often die together) and the carcasses get eaten by the other fish. This can happen overnight, especially with nocturnal feeders like catfish. Once the flesh has been bitten away, the remaining bones break up and are lost in the gravel.

This is why sick fish should be isolated. Any disease that kills the fish can be caught by the fish eating the carcass. This is especially the case with contagious diseases like Tuberculosis.

out and about

BAF '94

BY STEPHEN SMITH

Photographs — unless otherwise indicated — by Jon Montgomery

Colin Rumbold receives the Best Tableau award on behalf of Isle of Wight AS, from *A&P* Production Director Jon Montgomery.

I.o.W.'s winning tableau.

Peter Jones, of Cast'88, is presented with the Best Fish in Show trophy by John Dawes, editor of *A&P*.

Peter Jones' great little goby — winner of the Best Fish in Show award — proved that you don't have to be big to attract success in the fish world.

Darwen AS member Ian Haworth receives his prize for the Highest Pointed Individual Aquarium, from *A&P* editor John Dawes.

There has always been something special about the British Aquarists' Festival. The event organised by the Federation of Northern Aquarium Societies in collaboration with *A&P*, has been held every year for 43 years, formerly in the exhibition halls at the old Belle Vue centre in Manchester, and, in recent years, the new Bowler's Exhibition Centre at Trafford Park, Manchester. BAF has always been the one date in the fishkeeping calendar which is not to be missed.

This year's show, held over the last weekend in October (29-30), proved no exception, with a greater-than-ever participation by aquatic societies, supported by displays from some of the biggest names in the fishkeeping hobby. Around 7,000 people braved a miserable weekend to take in the show. And they were glad they did. A fine presence by over 25 exhibitors ensured that all branches of the hobby were well-represented. Among the highlights: advice and guidance was provided on the '**Aquarian**' stand by stalwart **Dr David Ford** and supported by **Dr David Sands**; while, on **Tetra's** stand, **Dr David Pool** and his staff were not only swamped with advice-seeking aquarists, but had a broad range of aquatic accessories, foods and treatments on display as well.

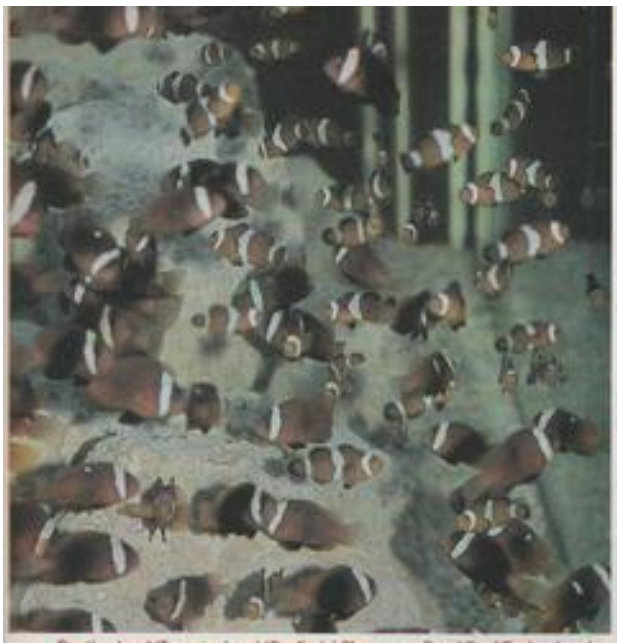
Yet another David of the fishkeeping world, **Dave Keeley** of **Underworld Products,** provided one of the most professional-looking displays and, again, he and his staff provided advice and guidance on a range of subjects.

Similarly, **Waterlife Research** provided a broad range of treatments, including a recently launched range for pondkeepers. I cannot fail to mention the highly-popular livestock stands of **JMC Aquatics** and **Belton Fish Farm** which, throughout the show, were kept busy by crowds of aquarists keen to acquire their latest additions.

One of the personal highlights of the event, for me, was an ingenious display by **Chester Zoo,** which was based around a giant wooden 'Noah's Ark' and which caught everyone's attention (including that of the traffic jams on the M6 after the show!).

Over 14 society stands provided support to the aquatic competition and these, again, covered every aspect of the hobby. I was delighted to see the involvement of **Northern Goldfish and Pondkeepers' Society** nestled among the **FBAS** and **FNAS** stands (see **Coldwater Jottings** elsewhere in this issue of *A&P*).

Providing a deeper insight into the hobby was a range of speakers who attracted an attentive audience. Our editor **John Dawes** related his *Dragon Fish Experience* (I've seen this talk, and you really shouldn't miss it if ever you get the chance), while **Dr David Pool** provided a fascinating insight into *Keeping Fish Successfully*. One of the most experienced (if not *the* most experienced) personalities in the hobby is **Dr David Ford,** and he gave a fascinating and often humorous insight account of *20 years with the 'Aquarian' Advisory Service*; while **Brian Walsh** of **FNAS** captivated his audience with a



Captive-bred 'Frenatus' and 'Ocellaris' Clowns on Coral Reef Technology's award-winning stand.

TO THE

By Linda Lewis

Photographs by the author

is comfortable, the food good, and the company excellent. Maybe I'll see you there next year...I hope so.

The race is on .... contestants in the furnished aquarium race.

LEFT — Dieter Vogt - globetrotting aquatic expert - was a great hit.

The Isle of Wight were deserved winners of the tableau competition.

MARINES: 97 SPECIES AND COUNTING...

PART SIX

BREEDING FOR DIVERSITY

Colin Grist of the Bristol Zoo Aquarium lays down some important guidelines for breeding marines.

Photographs by Trevor McDonald

Species that form pairs like Anemonefish (this is the Black-footed Clown — *Amphiprion nigripes*) can be spawned using the 4 x 4 method described.

If you breed, or intend to breed, fishes you will have a choice of two roads to go down. One is where you will choose broodstock from fishes which possess certain features which you wish to pass from generation to generation, such as long finnage or a particular colour.

The ever-popular Guppy is a classic example of this type of selective breeding, where the modern-day domestic varieties have been develped to show spectacular fin and tail shapes and all manner of colours and patterns.

The Guppy connection

The other road, the one that concerns us here, is where the fishes are bred to maintain genetic diversity and, therefore, viability. This method is of vital importance to the survival of species which are under threat in the wild, or may be at risk in the future. The problem with our old friend the Guppy, as we know it now, is that it is far removed from the original wild form. To maintain the domestic varieties, the fishes are in-bred with close relatives with similar, or even identical, features. This is an absorbing side of the hobby and there is nothing wrong with it.

However, the important thing to remember is that fishes (and other animals) lose genetic material with every successive generation when bred by this method, until a time comes when all individuals become genetically identical — in other words, diversity is lost. This often leads to weakness and susceptibility to infection.

Many readers will know that farm-bred Guppies are currently very prone to unusual infections, which are, almost certainly, a result of intensive selective breeding causing the loss of genetic material. You may have read about the Aquarian expedition to Trinidad in search of the wild Guppy which is being undertaken by Dr Peter Burgess and Stan MacMahon of Plymouth University in 1995, and you may have had a quiet giggle to yourself while thinking we don't need more Guppies in the hobby.

There is a serious side to this expedition, though, in that wild specimens can provide new blood and much needed genetic material. The fact of the matter is that even the Guppy's natural habitat is under threat and being rapidly reduced, but we cannot rely on the domesticated varieties to save it from possible extinction.

You may be asking, "What have Guppies got to do with breeding marine fishes?" After all, this series is supposed to be about **marine** fish breeding. Well, the captive breeding and rearing of marine fishes, as we all know, is still in its infancy, and the modern freshwater Guppy, after many decades of selective breeding, provides an excellent example to illustrate the points I am trying to get across here.

For example, some Anemonefishes, *Amphiprion* spp, have been bred and reared for many years and, I suppose, there are possibilities where selective breeding could be employed to produce different colour and pattern varieties.

Hybridising is another technique used for selectively developing new varieties, and already hybrids of the High-hat *Equetus acuminatus*, and the Jack-knife Fish, *Equetus lanceolatus* have been produced in captivity. Although hybrids do occur in nature, man-made crosses are not regarded as desirable where breeding for genetic diversity is concerned.

Vital steps

Let me outline the important points which I think we should consider if we want to go down the 'selective' road. Firstly, we must keep accurate records of our stock, such as where we obtained them from, which individuals were mated

Shoal-spawners like Fuseliers present the sort of captive spawning challenge that we don't, as yet, have an answer to.

INFO BOX

1. Keep accurate records
2. Try to start your breeding programme with wild-caught fishes.
3. Always choose broodstock at random.
4. Breed from an equal ratio of males and females, unless inappropriate for the particular species being bred.
5. Avoid using deformed or weak fishes.
6. Do your best to pair unrelated individuals.
7. Avoid producing hybrids.
8. Control the frequency of successful mating in any line.
9. Exchange offspring with other people breeding the same species.

Fig. 1

FOUNDER TANKS OR SOURCES

A	B	C	D

Fig. 2

F1 BROODSTOCK COMBINATIONS
Arranged from Founder tanks or sources

F1A	F1B	F1C	F1D
AxB	CxD	CxA	BxD

Fig. 3

F2 BROODSTOCK COMBINATIONS
Arranged from F1 offspring rearing tanks

F2A	F2B	F2C	F2D
AxD	BxC	CxA	DxB

together, where their offspring went etc.

If you are doing this, try to start your breeding programme with wild-caught fishes — not a problem where marines are concerned. Never pair your fishes because you like the look of a particular feature; always choose males and females at random.

Unless it is an unnatural mode of reproduction for the species involved, always breed from an equal ratio of males and females, as this will ensure the maximum transference of genetic materials. Obviously, avoid using deformed or weak fishes — these would not normally survive in nature. Do your best to pair unrelated individuals.

Avoid producing hybrids, and if these occur accidentally, disregard them and do not include them in any further breeding programmes. Try to control the frequency of successful mating in any line because, as an example, far less genetic material will be lost over a given period if the fishes are only allowed to reproduce once a year than if they are allowed to twice a year.

If possible, exchange some offspring with other people breeding the same species in order to expand the gene pool. This is where record keeping is very important so that you can ensure you do not exchange closely related fishes.

The actual breeding and rearing tank arrangement required to achieve our aims can be adapted from those which have been described earlier in this series; the following is a system widely used by zoos and other research establishments and numerous freshwater fish enthusiasts.

Ideally, you will require four tanks marked A, B, C and D to house four pairs of unrelated fishes, or you can give these codes to four separate sources of the four pairs you wish to breed (see Fig. 1). These eight fishes are known as the **Founders**.

To establish what are commonly known as **F1 Breeders,** you will need four tanks marked F1A, F1B and so on, and into these, you will mix the **Founders** in the following way: A female (f) x B male (m) into tank F1A, C m x D f into F1B, C f x A m into F1C and D m x B f into F1D (Fig. 2), or any other suitable combination.

Should your fishes breed, you will require at least one rearing tank for each line, and do not forget to give these the appropriate A, B, C and D coding as well.

After being successfully bred, keep the **Founders** in separate holding tanks for as long as possible as a safety back-up, in case you have to start again from scratch due to any culture crashes involving fry. Alternatively, you could use them to produce batches for passing on to other aquarists. It is also useful to have sets of tanks where you can keep the pairs which have already been bred from, and also others for fishes which you intend to breed from. Again, always code these tanks in such a way that you can easily keep track of each breeding line. These fishes are a useful reserve, particularly if the species you are working with is at risk of becoming extinct in the wild.

Second generation

To produce the next generation, it will probably be necessary to transfer the F1 broodstock to holding tanks, so that the breeding tanks can be used for the F2 pairs. These tanks are then re-coded F2A and so on.

Random fishes are chosen for the F2 broodstock from the four lines of F1 offspring in the following combinations: A x D into tank F2A, B x C into F2B, C x A into F2C and D x B into F2D (Fig. 3). Further generations can be established by simply rotating the combinations as used for F1 and then F2 generations.

As it is still early days in the field of marine fish breeding, this system can be regarded as a guideline only. In fact, it would have to be adapted in any case if the species you were trying to breed naturally reproduces in groups, or even harems. But, if the basic principles shown here are understood, adaptations can be made easily.

Collaboration with other aquarists can be useful, particularly as the number of tanks each will require can be reduced to save on space. However, in this type of situation, it will be vital to keep strict records in duplicate sets.

Although marine fishes are generally not under the same level of threat, conservationally speaking, as many species of freshwater fishes are at present, it does not mean the situation cannot change in the not too distant future. It is never too early to try to establish breeding projects to provide genetically viable stock for re-introduction into the wild, should this become a necessity — providing there are suitable wild places left that are protected sufficiently enough to allow such re-introduction to take place! AFP

NEXT TIME

The start of a few articles on the techniques and requirements for breeding and rearing different groups of fishes and individual species.

DAVID TWIGG'S

KOI CALENDAR

I would first like to wish a happy, successful and prosperous New Year to all readers of this column, whether you are a Koi fanatic, just interested in the coldwater side of fishkeeping, or somewhere in between.

Busy '94

1994 was a very busy year in the Koi world, particularly on the show front. I have not counted them, but virtually every weekend from May to September, a show was staged somewhere in the UK, with a couple actually being held outside of these months as well.

One of those was the last show of the 1994 season: **the Combined Section Closed Show**, which took place on 16 October, organised by the **Middlesex and Surrey Borders, London, South East and Eastern Sections** of the **British Koi Keepers' Society** as a finale to their year.

Held at **Koi Water Barn,** this show attracted 209 Koi from the combined membership, and several hundred people attended from all over the UK, even though the weather had taken a change for the worse.

Despite the very wet and windy weather, I am told that the 32 vats of Koi entered were excellent. The judging team of **Gary Pritchard, Roy Winterbourne, Val Frost, Doug Raby, Reg Coleman** and **Richie Penn,** produced the following results: **Jean Lingwood,** M.S.B. Grand Champion (Size 6 Tancho), Supreme Mature Champion (Size 5 Kohaku), Best Jumbo (Size 6 Kawarimono), Best in Size 5, Best in Size 6; **Keith Nind,** London Grand Champion (Size 5 Kohaku), Supreme Adult Champion (Size 4 Sanke), Best in Size 4; **Ray Tucker,** South East Grand Champion (Size 5 Kohaku), Supreme Baby Champion (Size 2 Sanke), Best in Size 2; **Graham Balkwill,** Eastend Grand Champion (Size 5 Sanke); **P. Turner,** Best in Size 3; **S. Allen,** Best in Size 1.

Other 1st Prize winners were: **George Rooney**, Kohaku,Showa Utsuri Mono; **K. Taylor,** Kohaku, Kin Gin Rin, Utsuri Mono, Hikari Moyo; **V. Bartlett**, Sanke, Showa, Kawarimono; **T & M Martin**, Sanke, Koromo; **K. King,** Kin Gin Rin; **C. Whitbread,** King Gin Rin, Bekko, Hikari Muji, Koromo; **K. Jackson,** Kin Gin Rin, Kawarimono; **B Woollands,** Tancho, Asagi/Shusui, Utsuri Mono; **Mr Eastes,** Tancho; **J Giddens,** Asagi/Shusui; **G. Saunders,** Asagi/Shusui; **C. Floyd & P. Holtum,** Asagi/Shusui, Koromo; **B. Edwards,** Asagi/Shusui, Hikari Muji,Hikari Utsuri, Hikari Moyo; **B. Marshall,** Bekko; **R. Wood,** Hikari Muji, Hikari Utsuri, Hikari Moyo; **T. & V. Hussey,** Utsuri Mono, Hikari Moyo, Kawarimono; **P. & P. Davis,** Hikari Moyo; **J. & W. Dummer,** Kawarimono.

Already, the 1995 Show dates are coming in, and it looks like being another busy year for the judges, organisers and volunteer workers who spend so much of their time and energy for the good of our hobby. Without these people, regardless of one's views on 'showing Koi', the hobby would be sadly lacking.

Through shows, we learn to appreciate the finer points of Koi by being able to compare like for like against the judges' decisions and by discussing them on the spot as well.

Jobs for the month

Not a lot to do during January, assuming that you do not heat your water and have stopped feeding your pets, but please don't totally neglect them. Keep a watchful eye open and your Koi may well benefit from the attention.

Koi continue to excrete ammonia from the gills at this time of year, and as this is heavier than water, it will sink to the bottom of the pond so, if your bottom drain does not feed to the filter, it will be necessary to continue 'pulling' the drain, albeit on not such a regular basis as at other times.

For those readers interested in purchasing Koi, this could be the best time of year. New stocks of fish, selected by dealers on their Japanese trips in October and November, are now being imported into the UK on a regular basis and should be looking at their best.

Now is a good time to buy Koi. These fish are photographed at Japanese Water Gardens.

Buying good fish

Selecting the Koi of your dreams is not easy. Most people buy a fish that, as a whole, pleases them and their family, but there are many aspects to contemplate when considering the whole.

Developing an eye for a good Koi takes time, but we all like to think that we can pick a quality fish and I guess that *is* the case where money *is not* a problem; just be guided by the price tag! The difficulty comes when trying to pick a beauty out of vat full of Koi, all offered at the same or similar price.

So what makes a good Koi? A judge at a show will be looking for a variety of things when making an assessment of a fish for placement against others in its class. Body shape and skin quality are the two most important of these qualities but, obviously, pattern, coloration, finnage and deportment are also taken into account and go towards making the complete Koi a pleasing fish to admire. Happy hunting!

What's on in January

1 — Eastend Section BKKS. *Meeting.* 7 pm. Wellstead Community Centre, Vicarage Lane, East Ham, London. Contact **Phil Davis,** 0279 443754.
4 — Border Koi Club. *Meet in Carlisle.* Contact **Mrs Amy Fisher,** 0228 513823.
— Leicestershire Koi Club. *Speaking on Water Quality* is **Frank Prince-Isles** of the **Koi Health Group.** B.S.C. Social Club, Scudamor Road, Leicester. Contact **Pip Ostell,** 0533 609707 or **Kevin Luckman,** 0455 250413.
8 — Central Section BKKS. *A.G.M.* 2.30 pm. T. P. Riley Community School, Bloxwich. Contact **Sue Finney,** 021 747 2733.
13 — Heart of England Koi Society. *Meet in Warwick.* Contact **me,** 0926 495213.
15 — Mid Somerset Section BKKS. Tony Staden talks on *Koi in Israel* — my visit. 2 pm. West Monkton Village Hall. Contact **Alan Purnell,** 0458 272132.
— Northern Koi Club. *Monthly meeting. Topic is Pond & Filter Design.* Contact **Tony McCann,** 061 794 1958.
22 — Heart of England Koi Society. *Winter pond visits.* A chance for members to look at a variety of winter covers used over our ponds. Contact **me,** 0926 495213.

Daphnia-fed Koi

I took a phone call from an A&P reader in Middlesex a short while ago. **Keith Stanhope** is a Prison Officer at H.M.P. Y.O.I. Bedfont Road, Feltham, who has recently become a member of the Middlesex & Surrey Borders Section of the B.K.K.S. in order to get more information about our

hobby, and filter building in particular. He is currently constructing a multi chamber filter for his 3000+ gallon garden pond in his garage.

While chatting, I learnt that, at the prison, Keith has a large 20 yards * 40 yards (but split into two by a reinforced wall) 4-foot-deep pond, into one half of which he fairly recently placed eight Koi, two of his own and six purchased from **Tony Purdy** at **Brit Koi**, a specialist dealer "just down the road".

These Koi were approximately 5in when introduced in June and are now well over 13in long, a fact that Keith puts down to (apart from the pelleted food fed by the inmates), the large quantity of *Daphnia* that is present in the unstocked half of the pond and has been drawn over the slightly submerged dividing wall. Although the water is not being drawn through it, the 12 inches of gravel on the bottom of this pond must be having a significant effect on the quality of the water in which these Koi live.

It is at the moment a very light stocking level and, perhaps, Keith and his colleagues might like to give thought to making the unused half of this enormous pond a vegetable filter so that the Koi population may grow successfully in both size and numbers. Thank you Keith for your call, and good luck with both your projects.

OPEN INVITATION

I would like to invite all Koi club secretaries or PROs' to send me their latest calendar for inclusion in my column, and to thank all those who have kept me in touch to date.

Although I do my best to ensure all events are mentioned, it may be that some information, which arrives a little late, misses my deadline. Ideally, I need to have information at least 10 weeks before the date of the event to guarantee publication. You may, of course, ring me direct on 0926 495213, which will allow a little leeway.

This request also applies to dealers with special events, auctions, etc. I look forward to hearing from you.

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

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

Show dates

April

29/30 International Koi Show, Telford Exhibition Centre.

May

28/29 Merseyside Section Open Show.
South Hants Section SKKS Open Show.

June

18 Crouch Valley Open Show.

25 Suffolk & North Essex Section Closed Show.

August

12/13 Koi '96.

TOP TEN TROPICALS

an Aquarist & Pondkeeper supplement

by Dr David Ford

Dr David Ford of the Aquarian Advisory Service introduces the most popular species of freshwater tropicals in the whole world.

The following are the top ten most popular freshwater tropicals out of the thousands of species and varieties found in the aquarium hobby today. This list is not the experts' choice, nor the traders' or breeders', (nor mine), but those fish that sell in the greatest numbers. Therefore it represents *your* choice of the Top Ten — whether suitable for the home aquarium or not! The following comments on each fish may change your views on some, but that is your choice too.

Neon Tetra (*Paracheirodon innesi*)
Cardinal Tetra (*Paracheirodon axelrodi*)
Angelfish (*Pterophyllum scalare*)
Guppy (*Poecilia reticulata*)
Molly (*Poecilia* spp)
Platy (*Xiphophorus maculatus*)
Swordtail (*Xiphophorus hellerl*)
Zebra Danio (*Brachydanio rerio*)
Dwarf Gourami (*Colisa lalia*)
Cory Catfish (*Corydoras* spp)

All the species are classed as 'Community fish' i.e. they can be mixed with each other without the aquarium turning into an underwater jungle! They will all accept the same water chemistry: usually mature, chlorine-free, local tapwater. They will also thrive on a diet of commercial flake food, so feeding and nutrition are not a problem.

Most will live for several years (but note the *average* lifespan is only three years — less for Guppies). They are representative of top, middle and bottom swimmers, and so give the whole aquarium a busy aquascene. They will also shoal well, so even the largest tank can be stocked with this colourful and active collection.

1 Neon Tetra

The bright red and electric blue flashes make the Neon (*Paracheirodon innesi*) the best-selling tropical fish in the world. Another reason is that they are so readily available at a low cost. This is because Far Eastern fish farms (mainly the Hong Kong ones) mass-produce the fish for the world market. In fact, so many are produced in Hong Kong farms that it is listed as the "Hong Kong Tetra" — but the fish is actually South American.

Adult Size: 30mm (1.2in)
Origin: South America, especially the Amazon.
Feeding: Omnivorous, readily takes flake food.
Breeding: Females are fatter, especially when full of eggs. Neons breed in shoals in soft, acid, peaty water. They pair off and scatter eggs which are left to hatch on their own. It is best to isolate these eggs and keep them and the fry in a dark tank. Infusoria (microscopic organisms) is needed as a first food and then ground flake or fry foods.
Comments: The fish have a species specific disease called *Plistophora* or Neon Tetra Disease, for which there is no cure. The symptoms are a spreading pale area under the dorsal fin, so look for signs of this disease when buying a shoal. The fish are unhappy alone; buy at least five (prices are around £1 each, but dealers often offer five for £4.50 etc).

BILLY WHITESIDE

A splendid Neon.

In this mixed collection there are both Neons and Cardinals. Can you spot the difference?

2 Cardinal Tetra

Even more vivid than the Neon, the Cardinal (*Paracheirodon axelrodi*) is slightly more difficult to 'farm-breed', and so is not so cheap or so plentiful. It is, however, hugely abundant in its native waters.

Adult Size: 30mm (1.2in)
Origin: South America, especially the north and east tributaries of the Rio Negro. It is found in shallow, still waters. A few farmed fish are available from various countries, but most of the specimens are still wild-caught.
Feeding: Omnivorous and thrives well on flake foods.
Breeding: Similar to the Neon Tetra, but usually spawns in the evening and fry are very photophobic (shy of the light), so a dark tank is essential.
Comments: The fry and young fish are poor travellers (probably because of the photophobia) so it is best not to buy small

BILLY WHITESIDE

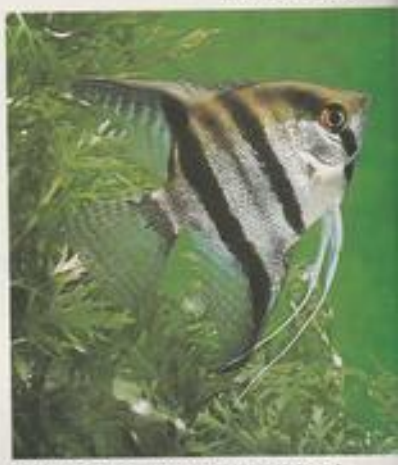
Three Cardinals. Note the red coloration — it stretches the whole length of the body.

(15mm-0.6in) Cardinals. The home waters are so soft that these fish cannot cope with hardwater life (unless they are conditioned gradually to these parameters) developing problems such as kidney stones. If you live in a hardwater area and cannot treat the water or condition the fish properly, it is best to avoid Cardinals.

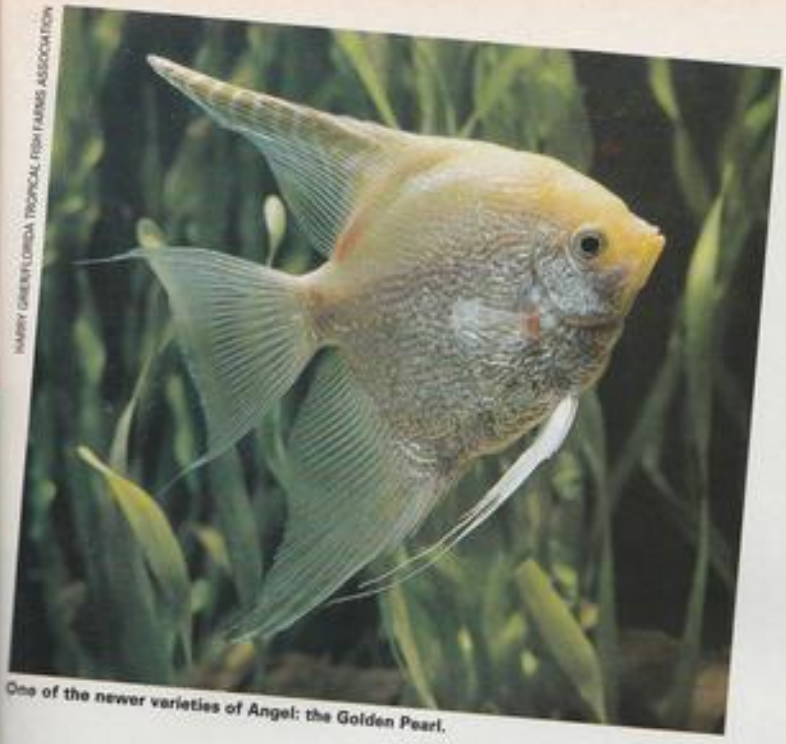
3 Angelfish

The Angel is actually the best selling tropical fish; it is because only a few are sold per customer, as against a shoal of Neons, that it is not listed first. The attraction is the unique body shape and silvery sheen. Angelfish can be long-lived and hardy, although more delicate varieties are common now. In fact, it is getting difficult to find an original *Pterophyllum scalare!*

AQUARIAN FISH FOODS



The 'basic', beautiful and original Angel.



HARRY GREEN/FLORIDA TROPICAL FISH FARMS ASSOCIATION

One of the newer varieties of Angel: the Golden Pearl.

Adult Size: 10cm (4in)
Origin: Central Amazon, but practically all are now farm-bred, with varieties such as Silver, Gold, Black and Veiltail freely available.
Feeding: Omnivorous, but prefers a carnivorous diet.
Breeding: It is almost impossible to sex the fish visually, but they pair off, often for life, from a shoal. Eggs are laid on a leaf and kept clean until the fry hatch. A pair will produce a family every few weeks if the fry are removed for raising separately.
Comments: Angels are cichlids, and so can be aggressive. The man-made varieties are usually peaceful, even timid, but a Common Angel will get increasingly belligerent with age. Their carnivore preferences also mean they will follow any livebearers around waiting to eat newborn fry instantly. Large Angels will also swallow small Neons and Cardinals. This fish has the wrong name!

4 Guppy

The Guppy (*Poecilia reticulata*) is a livebearer and is very prolific, hence it is always available and cheap. The original wild variety is called the Millions Fish and is widely used to control malaria, since it will soon eat all the available mosquito larvae in stagnant waters.
Adult Size: Females 30mm (1.2in) but males are smaller.
Origin: Widely distributed north of the Amazon (tropical regions), but has also been introduced world-wide in the tropic zones. It is intensively farmed in all the tropical countries that produce hobby fish.
Feeding: Insectivore and omnivore, but actually needs some vegetable matter in the diet. A flake diet that includes a herbivore flake is ideal.
Breeding: The male is the more brightly colourful fish and it displays continuously, although one insemination from its gonopodium (the modified anal fin) means the female is (virtually) permanantly pregnant. She will produce live young every month (but she can delay this if conditions are not right, e.g. poor water quality or too many predators around — such as Angelfish). To control the breeding, lots of mini-tanks are essential to separate the sexes and prevent in-breeding, which soon gives poor genetic stock.
Comments: Guppies have been farm-bred into many colour and fin shape varieties. Often, in-breeding has been used to

The Guppy comes in many colour and fin types.

AQUARIAN FISH FOODS

HARRY GREEN/FLORIDA TROPICAL FISH FARMS ASSOCIATION

A superb Florida-bred Rainbow Guppy.

fix a genetic line, weakening the fish. The original wild, hardy fish is rare in the hobby now, so the Guppy must be considered an annual fish, any lifespan over a year being a bonus. This is still better than in the wild, where predation means the males have an average lifespan of just three months!

5 Molly

Like the Guppy, the Molly is a livebearer and just as easy to farm and mass produce. There are several species, all peaceful and undemanding, but not all are suitable for the community aquarium. There are also numerous man-made varieties.

Adult Size: Variable, can be nearly 10cm (4in), but males are generally smaller.

Origin: Southern USA and Mexico, often in brackish waters.

Feeding: Herbivore, the fish grazes on algae with a rasping mouth, but can digest meat (insects). The best food is a general flake, plus a herbivore flake.

Breeding: The females are inseminated by the gonopodium of the male and then produce live fry at regular intervals. This is why any female Molly bought from a shop will be gravid (pregnant). Just as with Guppies, many small tanks are needed for controlled breeding. In the community tank, the fry are soon eaten.

Comments: Two of the most popular

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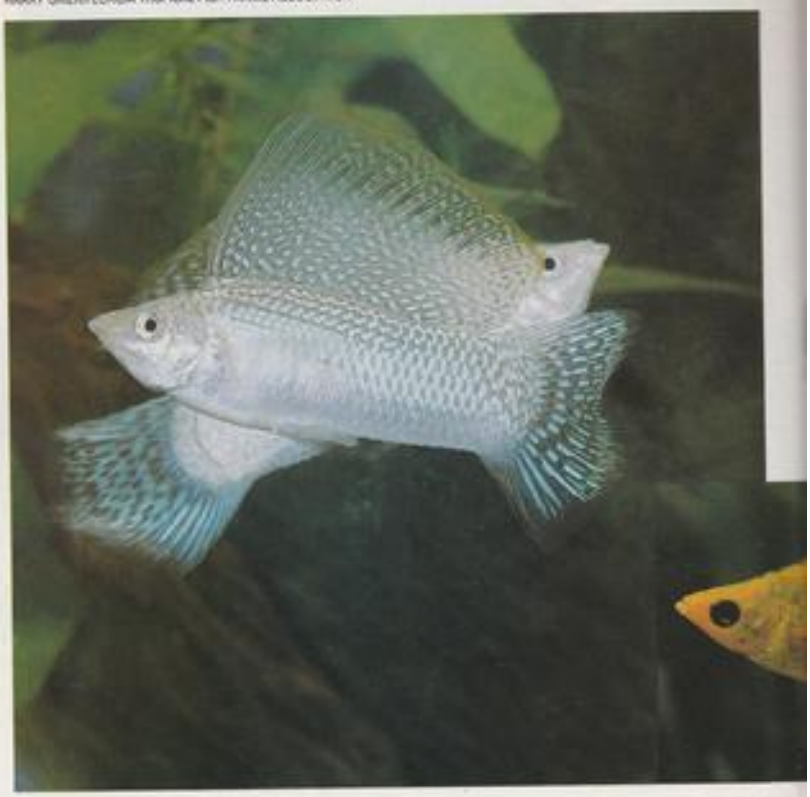

Mollies are the Sailfin and the Black Molly. Both require brackish water and do not thrive in the traditional community tank. In soft or acid waters, the Black Molly shows its distress by 'shimmying' (swimming on the spot) and develops problems such as Fungus. Despite its popularity, this fish is not really suitable for the strictly freshwater aquarium.

6 Platy

Only the Goldfish is more at home in an aquarium than the Platy (*Xiphophorus maculatus*). This is a lovely little fish, which is hardy, peaceful and easily bred; many colour varieties are plentiful and cheap. This fish should be the number one in the Top Ten Tropicals.

Adult Size: 40mm (1.6in); males are slightly smaller than females.

Origin: Mexico, Guatemala and Honduras, but most are from the Far East farms.

Feeding: Omnivorous; they thrive on flake foods.

Breeding: Like Mollies and Guppies, these fish are livebearers and, similarly, require multi-tank systems for controlled breeding.

Comments: It is best to breed each variety true, a Wagtail to a Wagtail, or a Moon to a Moon. Random breeding will produce nondescript mongrels. Note that the male can start breeding at only 12 weeks. There is also another type of Platy which is popular: the Sunset or Variatus Platy (*X. variatus*).

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***ABOVE LEFT* — Most of today's Mollies are of the Sailfin type, such as these Silver Sailfins.**

***ABOVE* — The lyretailed-form of Molly, such as this Gold Dust Lyretail, are becoming ever more popular.**

7 Swordtail

It is the sword (a modified tail) that makes the Swordtail (*Xiphophorus hellerí*) an attractive fish for the display tank. However, only the male carries a sword, which he uses to impress (or restrain) the female, so do buy both sexes for proper displays. Despite this sword, these are peaceful fish. Two males may display (but the winner is usually just the one with a longer sword) normally without actual fighting.

Adult Size: males up to 10cm (4in) with sword; the females are slightly larger, even without a sword.

Origin: Central America, but the vast majority of specimens will be farmed fish from many countries now.

Feeding: Omnivorous and thrives on flake food, but a little vegetable matter in

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***ABOVE* — A subtly-coloured Florida Blue Moon Platy male.**

***BELOW* — Neon Wagtail Platy. All Wagtails have a black tail.**

STOCKING LEVELS

The listed sizes of tanks start at 18x12x12in (45x30x30cm); you should not have an aquarium any smaller than this ... the water volume would be so low that pollution from the fishes' excreta will harm them. A better choice is 24x12x12in (60x30x30cm), but the most popular aquarium is currently the 36x15x12in (90x38x30cm) ... the extra height (15in) is needed by most aquatic plants.

The capacity in gallons and litres is the average water content *after* adding sand or gravel and accessories. It is assumed that a filter is used (essential to keep the water sweet).

Remember that fish are bought as juveniles and may double in size in a few months, so stocking levels should be half the recommended maximum of surface area in inches, divided by 10 to give inches of fish (excluding tails) added together (surface area in cm divided by 25 for cm of fish).

Suggestions

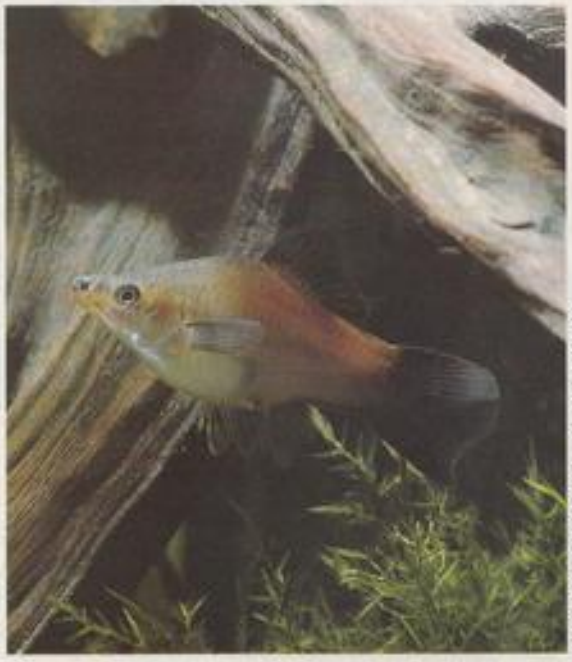
1 18in (8 gal, 36l) — 15 fish: Angelfish are too large (when adult) for an 18in tank. Choose a shoal of Neons (5); 3 male, 2 female Guppies; 3 Platies and 2 Corys to give top, middle and bottom activity.

2 24in (10 gal, 48l) — 20 fish: A couple of Angels and a trio of Dwarf Gouramis can be added to the 18in selection.

3 36in (20 gal, 93l) — 30 fish: Zebra Danios appreciate the longer swimming area, so a shoal of 5 can be included to the above. A trio of Mollies and a pair of Swordtails (one male, one female).

4 48in (30 gal, 125l) — 45 fish: All the top ten can be mixed, with, at least, trios of each species.

NOTE: the maximum number of fish must not be added at once ... the system has to mature, so add each species as trios or more at weekly intervals.



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ever, most grow 'over-large, hence the attraction of the Dwarf for the tropical aquarium. Also, when the male is in breeding condition, it is acknowledged to be the most beautiful coloured of all tropicals.

10 Corydoras Catfish

There are almost 200 species of *Corydoras*. Most are suitable, indeed useful, community fish in that they live on the bottom and are very active, yet peaceful. Some hobbyists are so devoted to Corys, that they keep and breed nothing else.

Adult Size: 60mm (2.4in)

Origin: South America — almost every river has its own species or subspecies of *Corydoras*.

Feeding: Insectivore — in the wild it digs for aquatic insects and worms, but it will eagerly take flake (or tablet) food that reaches the bottom of the tank. To condition for breeding, include a feed of *Tubifex* or Bloodworms.

Breeding: The females are larger than males, and a pair need to be isolated in a tank of mature but well oxygenated water. The eggs are sticky and laid on a flat stone or leaf surface. The parents can then be moved and bubbles from an airstone used to help oxygenate the eggs until they hatch.

Comments: Although there are many species, the one mass produced in fish farms is the Peppered Catfish, *Corydoras*

MIKE SANDFORD

***ABOVE* — The Albino form of the Zebra.**

***BELOW* — A long-finned Leopard Danio. This is now known to be a single-gene mutant of the Zebra Danio.**

MIKE SANDFORD

HARRY GRIER/FLORIDA TROPICAL FISH FARMS ASSOCIATION

HARRY GRIER/FLORIDA TROPICAL FISH FARMS ASSOCIATION

***ABOVE* — This is the albino form of the Bronze Corydoras.**

***LEFT* — The most popular Corydoras is the Peppered Cat.**

paleatus. Next most popular is the Bronze Cory *C. aeneus* and then the Leopard Cory *C. julii* and Reticulated Cory *C. reticulatus*. Wild specimens are also seen, imported from Brazil, but remember that wild fish may carry diseases and parasites and may require greater acclimatisation/quarantine.

With its large winking eyes, armoured body and whiskers (barbels for seeking food in the mud) you can see why the Cory is the favourite bottom-living fish for aquarists. However, a caution: Corydoras have a protective spine on the back, so never personally handle the fish. This spine can prick you and inject poison or bacteria. The fish is also gregarious and unhappy alone, so always get a shoal, even if it is of mixed species.

AAP

THE SPECIES AQUARIUM

The community tank is very interesting to study because each species has its own characteristics and has to interact in an isolated ecosystem. However, the species aquarium is more decorative because the fish shoal and swim like a flock of birds, giving living colour.

1 18in – the ideal aquarium for a Guppy collection. The fish will also breed and produce lots of (live-born) young, so be prepared to buy more tanks!

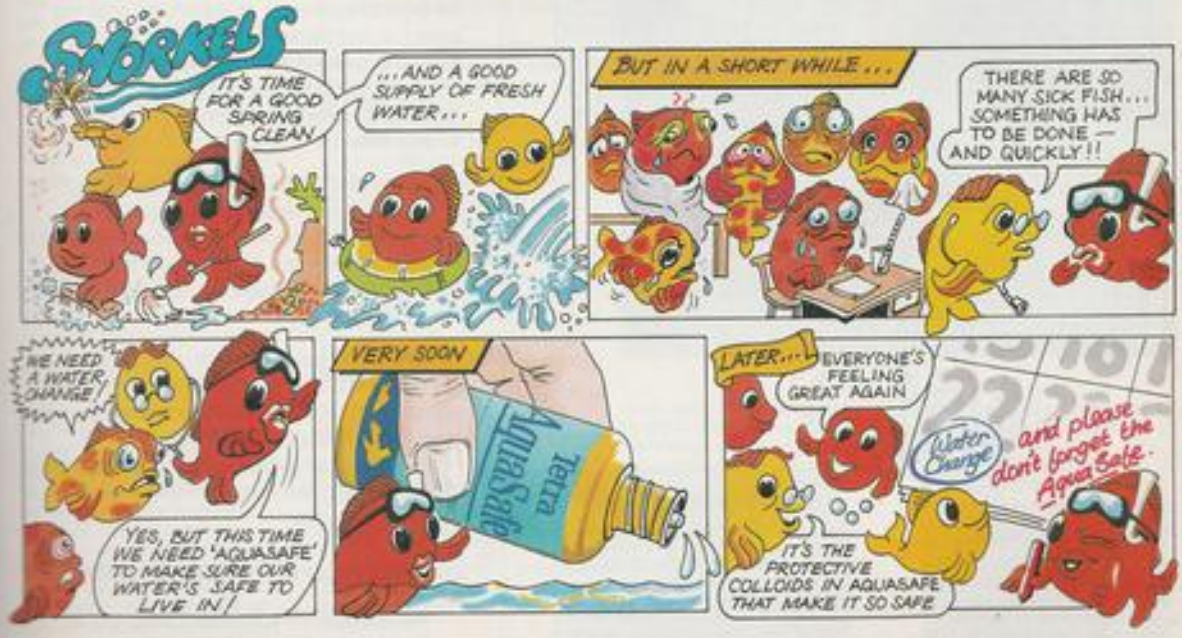
2 24in –25 Neons or Cardinals, or mixed, with a background of small plastic plants, will look like living jewels.

3 36in – the 20-gallon tank is ideal for a shoal of Angels. They will grow very large and form pairs, possibly even breeding (egg layers). They may also squabble and have battles, but it is (usually) all display, not damaging. Only 6 are recommended, since one large Angel can equal 10 small Guppies in biomass!

4 48in – this aquarium is large enough to stock two or three shoals of different species, such as 50 Neons and Cardinals, 25 Zebra Danios and 12 Corydoras. The three groups will swirl around at different levels and give a beautiful tropical scene with a backdrop of aquatic plants.

NOTE: build to the maximum stocking levels over several weeks. If shoals of fish are added to the brand new tank, many will die. Only mature water and mature filters can keep the crowded aquarium's water sweet and clean.

NEXT MONTH: Special Supplement on Aquarium and Pond Equipment. DON'T MISS IT!



WRITEBACK

BIOPLAST LETTER OF THE MONTH

Disgusted of Preston

I was disgusted when I read Stephen J Smith's **Soapbox** in the October instalment of **Coldwater Jottings**. A Mr Jack Frisby, who had spoken to Mr Smith, was complaining that many people burdened him with problems which *"in the main are caused by advice given by inexperienced but well-meaning 'Saturday helpers'"*.

Mr Smith then said that he agreed with this, and that *"fish themselves are suffering stress and, in extreme cases, even death as a result of such often ill-founded advice"*.

At the age of fourteen, I was regularly buying fish from different retail outlets, and receiving bad information from most. I then found a nice outlet run by a married couple, who had excellent advice to give, with fish of very good quality, kept in scrupulously clean tanks. Although only a small shop, it later doubled in size. After about six months of buying stock only from this shop, I was offered a Saturday job on the grounds of knowing my fish and how to look after them properly.

All the information I knew, I had learned from books, magazines and experience, as well as from this outlet. I was very flattered that I had been picked out of the many customers who buy fish there. After this, I started to read more about fish at every opportunity to add to my knowledge of the hobby.

Now, two years on, I have kept many fish, including Discus, with good breeding success. The job, which now takes up any free time between college lectures, gives me great satisfaction. I get on well with the customers, who are just as happy to be served by me or my employer, knowing that I will gladly forego a sale if their fish are not compatible, or their new tank is not ready for fish. If there is something I do not know, my employer is always within shouting distance to lend a hand.

As you can see, not all Saturday workers are completely useless and give out *"ill-founded advice"*, working for their weekly pay packet.

My reason for writing, is to tell Mr Smith and Mr Frisby that although there are *some* Saturday helpers who are useless at their jobs, one doesn't need to suggest that people buy from outlets during the week to avoid them, because there are some of us who care deeply for fish, find our jobs very rewarding and are glad to pass on our knowledge to others.

Maybe the 'older and wiser' Mr Frisby should think before he (unknowingly ?) offends younger hobbyists like myself.

Lee Hammond,
Preston,
Lancs

Thank you, Lee, for presenting a well-argued case. We've chosen your letter as our first BIOPLAST Letter of the Month for 1995. You will shortly be receiving a parcel of products from BIOPLAST (UK) Ltd (Tel: 01435 630230). See Stephen Smith's comments for some further thoughts on the subject.

Ed

Stephen Smith comments

I am delighted to read Lee's most comprehensive letter; he obviously shares my concerns. It appears that much of what he says actually agrees with some of my points presented in **Soapbox. Coldwater Jottings** provides a forum for lively debate and for readers' opinions, and it is certainly not expected that anyone should agree totally (or even at all!) with either my views or those aired by readers.

The point of the **Soapbox** in question was twofold, in that it conveyed the experience of an individual reader, while at the same time, providing an opportunity to advise hobbyists that, yes, aquatic retailers are, indeed, a good source of information about the hobby. Please don't,however, expect them to be able to provide the time to be forthcoming with detailed advice during their busiest periods (ie: at weekends). Having said this, the majority are more than happy to spend a great deal of time with their customers during quieter periods of the week.

Lee does acknowledge that he has, himself, received "bad information" from most aquatic outlets. My own experience is quite the opposite: most retailers are fully-conversant with the hobby and will do all they can to provide 'added value' to their customers.

It has been my experience, on occasion, that some, though certainly not all, weekend-only staff may not be as thoroughly conversant with the details of the aquatic hobby as the full-time staff, for whom the hobby is, after all, their livelihood. I would certainly not suggest that "Saturday workers are completely useless". Quite the opposite. Indeed, I would strongly urge any young aquarist who wishes to develop a career in the aquatic industry to gain as much experience as they can, and weekend work in retailing provides a valuable grounding for the next generation of the industry.

I should point out that I purposely did not mention any specific aquatic outlets referred to by Mr Frisby in his communication with me, so no assumptions or implications should be made about any identities. All that I can say is that the outlet in question certainly was not one which had recently been opened.

Debate is a healthy ingredient in the success and development of the hobby. I am delighted that Lee has aired his views, and no offence at all should be taken from Mr Frisby's comments to me, or from my comments in **Soapbox**.

Stephen Smith

Unnecessary indoor over-wintering

I read recently in one of your articles, that you advised people to overwinter Red Shiners indoors.

Red Shiner — tougher with regard to British winters than many people think.

HARRY GRIER/FLORIDA TROPICAL FISH FARMS ASSOCIATION

Well, as far as I'm concerned, my fish — Red Shiners, Rosy Red Minnows, and common Fathead Minnows — always stay outdoors in their pond during winter. People don't seem to realise just how hardy these fish are.

My friend, the late Vernon Hunt, was a great advocate of over-wintering these fish outdoors. He, himself, used to bring fish back from America and told me about some of the adverse conditions they live in.

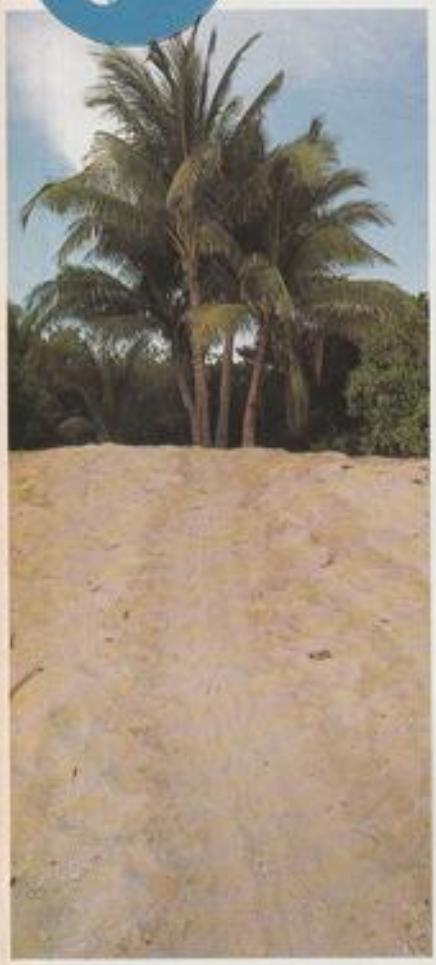
Don't think I'm saying *not* to bring your fish indoors; I'm only saying it's not necessary. As long as they are healthy, well-fed fish, as mine are, they will easily survive our winters.

Eric Hollis,
Speke,
Liverpool

Turtles of Malaysia

THE SPECIES

PART ONE



Many turtles prefer overhanging vegetation at the back of the beach for egglaying.

Encounters with turtles are a tremendous thrill when diving and snorkelling, and there are some areas in Malaysia where such highlights can still be guaranteed. **Jack Jackson** reports.

Photographs by the author

The history of turtles goes back to the age of the Dinosaurs, at least 150 million years. Apart from sea snakes, marine turtles are the only remaining truly marine reptiles. The marine turtles of today — which can live for more than 100 years — have changed little in their evolutionary history and still closely resemble their fossil ancestors.

Of the seven species of marine turtles living in the world's oceans, six can be found in Malaysian waters: the Green Turtle (*Chelonia mydas*), the Hawksbill Turtle (*Eretmochelys imbricata*), the Loggerhead Turtle (*Caretta caretta*), the Leatherback Turtle (*Dermochelys coriacea*), the Pacific Olive Ridley Turtle (*Lepidochelys olivacea*) and the Flatback Turtle (*Natator depressus*). Only the Kemp's or Atlantic Ridley Turtle (*Lepidochelys kempi*) is not found here. The Black Turtle (*Chelonia agassizi*), is believed to be a subspecies of the Green Turtle.

Four of these turtles regularly nest on Malaysian beaches: the Green, the Hawksbill, the Leatherback and the Pacific Olive Ridley. The two turtles most commonly encountered are the Green Turtle and the Hawksbill Turtle. They are difficult to distinguish underwater, where both appear to be a mottled dull green.

The Green Turtle is usually larger. The Hawksbill Turtle has a distinct beak, while its carapace (shell) has overlapping plates and its outer edge is usually jagged.

BELOW — Fringing reef, pure sand and 'quiet' island — perfect for nesting turtles.

Land/sea comparisons

The bodies of marine turtles are entirely covered by a firm shell, from which only the head, limbs and tail emerge. Unlike those of land turtles, the head and limbs cannot be retracted into the shell, so they are vulnerable to predators, such as sharks, though they often survive with missing limbs.

The upper shell (carapace) and the undersurface (plastron) are formed by the welding together of polygonal dermal plates.

When compared with their land-based counterparts, marine turtles have a depressed carapace and limbs which are flattened and, thus, facilitate swimming. Except with the Hawksbill, these limbs cannot support the body weight on land. Their bones are flattened, widened and extended laterally, in the form of spurs, as in dolphins and whales.

The carpal (wrist) and tarsal (ankle) bones are fused together, and the digits are contained within the flippers. Swimming is analogous to the flight of birds, the flippers moving up and down, rather than to and fro.

Turtles are air-breathing animals, but

Turtles of Malaysia

ABOVE LEFT — Surgeonfish grazing off the algae growing on the carapace of a Green Turtle.
ABOVE RIGHT — Hawksbill Turtle showing the overlapping carapace plates.

Indo-Pacific marine turtles

IDENTIFICATION KEY

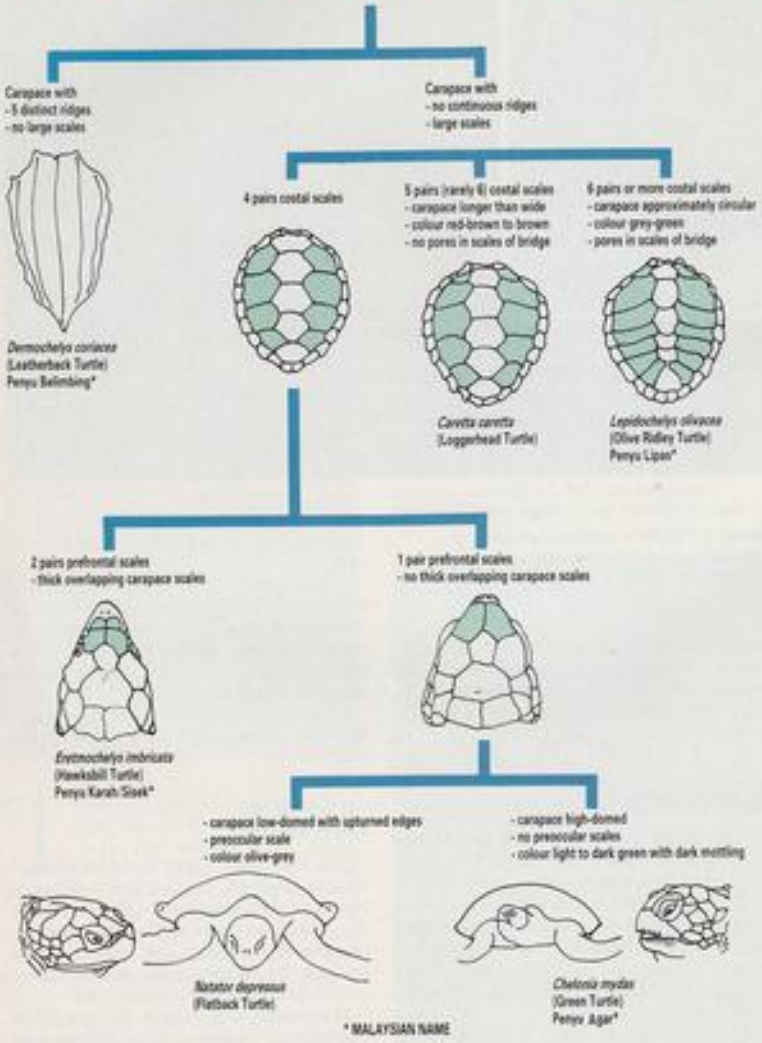


Figure reproduced by courtesy of Pulau Redang Marine Park Visitors' Centre, Malaysia.

They nest either by day or night, and prefer to lay under bushes, on beaches along sheltered bays.

Loggerheads

The Loggerhead Turtle is similar to the Green Turtle, but has a larger head. It is carnivorous, feeding on fish, molluscs and crustaceans.

Leatherbacks

The Leatherback Turtle differs from other marine turtles in that its carapace is relatively thin. It is formed only of dermal ossicles; in other words, it is not fused to the underlying skeleton, but contains the ribs and backbone embedded in it. It is heart-shaped, has the appearance of brown leather and bears seven longitudinal ridges. Algae and barnacles do not grow on this carapace.

The Leatherback is the largest marine turtle, reaching 1.83 metres (6 feet) in length and weighing up to 454 kilograms (1,000 pounds).

Adult males differ from females in having concave plastrons and thick tails, which extend past their rear flippers.

The greatly reduced weight of the Leatherback Turtle's carapace, its more streamlined shape and long flippers, enable it to swim at up to 10 kilometres (6 miles) per hour and to cover huge distances, following its prey, jellyfish, which travel at the mercy of the ocean currents. Migrations of 5,900 kilometres (3,650 miles) have been recorded for this species.

In the last two years, two of these gentle giants have been picked up off the coast of the UK. One of them was still alive and was returned to warmer waters.

Leatherback Turtles feed on jellyfish, their scissor-like jaws being well adapted for holding and cutting soft and slippery prey. Other invertebrates, like Tunicates (Sea Squirts) and Ctenophores (Comb Jellyfish) are also eaten.

Plastic bags are often mistaken for jellyfish and eaten. Once swallowed, these plastic bags cannot be digested and block the intestines, causing the animal to starve to death.

(TO BE CONTINUED)

FASCINATING FISH FACTS

Topsy-turvy catfish

Lots of fish are counter-shaded, which simply means that their undersides are lighter than their backs. This evens out the effect of light which comes from above, and makes them look flatter and less conspicuous.

Of course, if you swim the wrong way up, like the Upside-down Catfish (*Synodontis nigriventris*) this idea doesn't work! So, these fish have darker bellies and are lighter on top.

They also have lockable spines in their dorsal fins, which they can erect when afraid or stressed. They therefore have no qualms about puncturing the nice new plastic bag they've just been put in, ready to be carried home. So, if you want to buy Upside-down Catfish, make sure you're ready with lots of extra bags!

Linda Lewis

LINDA LEWIS

Upside-down Catfish in typical upside-down pose.

Cuckoo cat

We are all familiar, of course, with the Cuckoo which lays its eggs in the nest of other species of birds, leaving its chick to be reared by bemused foster parents.

After Dr. David Tipping's article Sneaky Little Breeders, published in the August '94 issue of *A&P*, we are all now also acquainted with a superficially similar type of behaviour among fish... except that the 'pseudo-cuckooing' takes place among members of the same species.

However, in the case of *Synodontis multipunctatus* from Lake Tanganyika, the cuckoo impression is complete, since pairs of this species dive into the commotion created by a spawning pair of mouthbrooding cichlids, leaving their fertilised eggs and fry to be cared for by the unwitting foster parents.

So what came first, the cuckoo or the cat?

MIKE SANDFORD

Synodontis multipunctatus, looking deceptively normal.

The Supreme Champion was this *Synodontis macrops* owned by Mark Irvine.

out and about

SUPREME END SHOW SEASON

Last year's **Supreme Festival of Fishkeeping**, held at Weston-Super-Mare in November, was great; the 1994 event was even better! My only complaint is that there was so much going on, that I had difficulty deciding where to go next: there were lectures, a quiz, competitions, stands to visit and people to meet, plus of course, the fish.

At evey turn, I was faced with beautifully designed and planted tanks. Most were so well done, that you would think the fish and plants had been together for months, rather than a day or two. A panel of judges had the difficult task of deciding which trade stand sported the best furnished aquarium, with the award going to **Watermarque** who had both a freshwater and a marine set-up.

The award for Best Trade Stand went, for the second year in a row, to **Coral Reef Technology Ltd**, helped by a stunning display of almost 200 clown fish (*Amphiprion ocellaris* and *A frenatus*) — all captive-bred in Israel.

The show's centre piece was an Indoor Water Garden, previously seen on the **Anglo Aquarium Plant** stand at Hampton Court. The pond came complete with Koi and a very cheerful lady in a wet suit, who never tired of posing for the TV cameras, or talking to any child who wanted to try on a snorkel.

Every stand was good to look at, and staffed by helpful people, able to answer all manner of questions on the hobby. Special discounted prices meant that they, too, were kept busy. At the opposite end of the site, a variety of other stands were selling anything from plastic plants to videos about Oscars, from made-to-measure tanks to College courses (**Sparsholt**). One of the most popular was that of **Bristol Zoo** which sported, among other creatures, enormous snails, snakes and giant cockroaches! They also managed a sideline in face painting.

In another room were the society tableaux. Here, aquatic societies had gone to a great deal of time and effort to mount themed displays **Bracknell's** resembled a back garden, while **Portsmouth** had made an arcade in which the shops were aquaria. **Hounslow** had a section of tanks illustrating the different kinds of tanks you could have (species, livebearers, coldwater etc) but the deserved winner of the award for best tableau was the **Isle of Wight**.

To describe their display adequately would take several pages. In short, the front featured a political satire - Jungle Book 11 - while the remaining side made up a fish house, but with the tanks facing outside for viewing. The variety and quality of the fish was superb. I could have spent ages just talking to the various society members, but other events called.

There was, for example, a furnished aquarium race in which teams of people had to set up an aquarium (using plastic plants of all colours, and rocks) in just 20 minutes - the prize being a complete tropical set-up. It sounds fun, until you realised that the water they were working in was icy cold.

As last year, the **Aquachamp** final was held over the two days. General questions on Saturday were followed by each contestant's specialist subject on the Sunday. I listened to ten questions before getting one right. This year's winner was **Dave Campbell**, from Aberdeen, making this the first time the champion has hailed from Scotland.

I somehow managed to find time to squeeze in two lectures given by **Dieter Vogt**. I have to admit that before the Festival, I had never heard of him, although he has been a prominent figure in fishkeeping for many, many years.

I found Dieter to be a truly charming man. Unfortunately, although he speaks English very well, his pronunciation was sometimes (quite understandably) a little hard to follow. I persevered and was very glad that I did, for his second lecture was absolutely wonderful. He spoke of his travels in search of fish, and of one trip during which he lost 16 lb in weight in one day. His great knowledge and love of his subject shone through, and his gentle, self-effacing humour made almost two hours fly past. I will certainly be keeping a look-out for any of his books or articles (I only wish that I could read German).

For me, the other highlight was '**The Fish Show**'. On the Sunday, both the **European Open Show** and the **1994 Supreme Championship** were contested, and from early in the morning, fish of all shapes and sizes began to appear for judging. As each one is in great condition, and very well cared for, the judges have a difficult task, especially when choosing the Supreme Champion. Each fish in that competition is already a show winner, and somehow, the panel must select the best from species as diverse as Odessa Barbs, Zebra Danios and catfish.

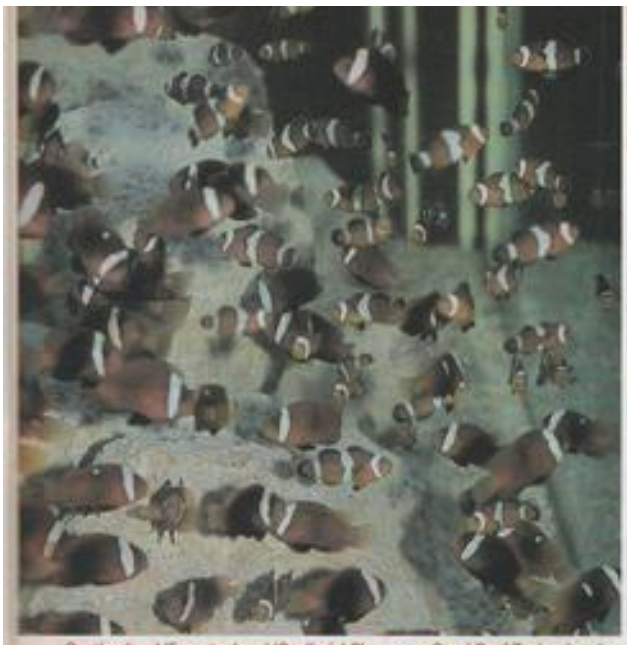
Secrecy surrounds the announcement of the **Supreme Champion** - even the winner only finds out right at the end of the Festival. I was lucky that I had happened to photograph the eventual winner, a *Synodontis macrops*, belonging to **Mark Irvine**. Maximum points available are 100 and I believe this fish scored 93!

In the Open Show, the award for **Best In Show** went to a Kyburz Tetra (*Pseudochalceus kyburzi*) owned by **T Roberts**. This fish is now eligible to enter the Supreme Championship next year; I will certainly look out for it in 1995.

What makes the Festival even more unmissable is that you can stay at Sand Bay and enjoy a mini-holiday. The accommodation

Fully equiped SCUBA diver entertaining children around the giant Koi pool.

Best Fish in Show: a Kyburz Tetra owned by T Roberts.



Captive-bred 'Frenatus' and 'Ocellaris' Clowns on Coral Reef Technology's award-winning stand.

TO THE

By Linda Lewis

Photographs by the author

is comfortable, the food good, and the company excellent. Maybe I'll see you there next year...I hope so.

The race is on .... contestants in the furnished aquarium race.

LEFT — Dieter Vogt - globetrotting aquatic expert - was a great hit.

The Isle of Wight were deserved winners of the tableau competition.

SEAVIEW

BY GORDON KAY

GLAMOUR SHOWS

I was at the NEC some time ago, indulging my other passion (cars), when it struck me what is missing from aquatic shows — Razamatazz. Glitz. Pizazz! Call it what you will. You may have read me wingeing on about how dull and — dare I say it — boring aquatic shows have become. Well, the answer was there for all to see at the Motor Show. I'm not suggesting that we have scantily-clad ladies draped over the aquariums, but some of the colour and style wouldn't go amiss. Let's have some glamour folks!

Whaling '94/'95

The last **International Whaling Convention** was held in Puerto Vallarta, in Mexico. The big issue of the whole thing was the setting up of the Southern Ocean Sanctuary around Antarctica.

To all intents and purposes, the sanctuary puts an end to Japanese whaling, because they will now no longer have a major hunting ground. Japan has still managed to kill around 300 whales every year since the moratorium on whaling began in 1985/86 — all of them in the Antarctic.

Recently, Japan has been lobbying other countries — especially those in the Caribbean — and their votes, in a bid to block the establishment of the sanctuary, with generous aid packages. The Caribbean nations — apart from St Lucia — all abstained when the voting took place. The St Lucian contingent left the day before.

As for Norway, well, they resumed commercial whalling in '93. Apparently — to my amazement — the American Vice-President, Al Gore, had given his personal assurance to the Norwegian Prime Minister, Mrs Brundtland, that America would assist Norway to achieve the resumption of commercial whaling.

However, the IWC's own scientific committee produced a new analysis of Norway's argument that there are 88,700 Minke Whales in the North East Atlantic, which suggested that the actual figure was significantly lower. In view of this, the British asked Norway to reconsider its stance. However, the Norwegians declined and, in fact, issued their whalers a quota of 301 whales for 1994. It should be said, though, that permits will not be issued for '95.

The commission discussed other stuff, like the development of whale watching on a commercial basis — despite the objections of Japan and Norway — the resumption of whaling in the future, under the 'Revised Management Scheme', and the humane killing of whales. It also discussed a new classification of whaling, to fall between the two it now recognises — these being 'Aboriginal Whaling' and Commercial Whaling.

Once again, Japan produced strong evidence to support her claim for an interim quota of 50 Minke Whales for — and I quote — 'small type coastal whaling'. The claim was refused.

Finally, something is at last beginning to happen in the fight for small cetaceans. Brazil, bless 'em, proposed a resolution — passed by the commission — which invites members to co-operate with the scientific committee by gaining information on kills (deliberate or otherwise), population estimates and threats to small cetacea. This seemingly small initiative is, to me, perhaps one of the most important (and gratifying) things to come out of the whole year.

Marines of the '60s

In all of the years that I've been keeping coral fishes, the hobby has progressed in leaps and bounds. Nobody could possibly argue with that statement.

I can't resist buying old aquarium books and nowhere is the aforementioned fact more emphatically brought home than when I dip into some of these old tomes. For instance, a book called *Coral Fishes* by T Ravensdale, was issued in 1967 and the differences between accepted methods, rules and ideas in the '60s and those of today are amazing.

One way in which the old work differs is in the chapter on water. Commercial, synthetic seawater merits only a passing mention, while making one's own or — God forbid — even collecting natural seawater, is discussed at great length!

Now, before I get wads of post, I realise that the British coast of nearly thirty years ago was very different from now, OK?

There is also discussion on a very quaint old piece of kit called 'urine removal device', which appears to be an extremely crude forerunner to the protein skimmer.

There are some very strange photographs showing the weirdest aquariums imaginable — with plastic plants all over the place — and some of the animal write-ups are nothing short of incredible. For instance, it quotes the Yellow Long-nosed Butterfly (*Forcipiger longirostris*) as being much more delicate than *Chelmon rostratus* — the Copperband Butterfly!!

Yet, despite the fact that these books were obviously written at a time when everyone was still only learning their craft, and are full of now discredited ideas and techniques, the basics are all there. Some of those old seawater aquarium books make very interesting reading!

***Chelmon rostratus* — more delicate (as this specimen shows) than the 60's books led us to believe.**

SNIPPETS

1

Female Ghost Spider Crabs, which live in the Mediterranean, mate with many males during the breeding season, but only the sperm of the last male will fertilise the eggs. He achieves this by producing a mixture of sperm and natural glue. First, he deposits the glue into the female's sperm storage organs, then follows this with sperm. Previously deposited sperm is then pushed into the back of the storage chamber, where it is sealed in by the setting glue, so that it cannot fertilise any eggs. In this way, a male ensures that he is the father of all the eggs the female lays.

2

The Flying Gurnard, a fish of up to 20in (c 50cm) in length, lives in warm seas. It has huge pectoral fins — divided into large and small 'wings' — that enable it to glide above the surface of the sea for short distances. In this way, it can easily escape predators.

KOI WATER-KEEPING SKILLS

Barry Goodwin sorts out fact from fiction and shows you how to establish and maintain good water quality for your Koi.

FILTERED FACTS

PART ONE

Many new hobbyists have unfortunate misconceptions with regard to exactly what is meant when "water quality for Koi" is spoken of, and how toxic certain substances we can find within our ponds actually are. Understandably, new Koi keepers may also find it difficult to understand how these substances are kept under control.

The first obstacle for the newcomer to negotiate is an understanding of the theory of the biological filter and its main function within the system. I will therefore explain the basic principles of its operation before I go on to explain a little about the toxicity of ammonia and nitrite, the two main pollutants of the pond water.

Biological filtration

Our Koi, being aquatic animals, are what is known as '*ammoniotelic*', that is, they excrete more than 50% of their waste nitrogen as ammonia.

Ammonia is passed into the water, primarily through the gills, and can very quickly, within the confines of a Koi pond, rise to extremely toxic levels. Ammonia also comes from the mineralisation (or amination) of other organic waste within the pond, and is formed by the action of so-called *heterotrophic* bacteria.

In the wild, fish are in very large volumes of water and such build-ups of ammonia would no occur, hence no problem would therefore present itself. Because ammonia does build up in ponds, however, we must make provision to remove it from the water before it can do any harm, and this we can do by means of a biological filter.

A healthy collection of Koi such as these can only be maintained for any length of time through constant attention to water quality.

A biological filter is a very different thing to a mechanical filter and should not be envisaged as producing sparkling clean water. This is achieved by other means, such as settlement and sand filtration. This biological filter is purely there to remove the harmful ammonia content of the water.

Pond water is directed through this filter which enables colonies of naturally occurring bacteria to establish themselves on a suitable medium (or several media) provided for this purpose. This action will allow the bacteria to oxidise ammonia into slightly less toxic substance called **nitrite.** Do not confuse this with **nitrate.**

This oxidation cycle continues and further bacterial types establish themselves in the media. These, in turn, oxidise the nitrite into nitrate which, at the levels at which it can be expected, is not toxic to our Koi. Nitrate does cause other problems by promoting algal growth, a subject which is really outside the scope of this article, so I will discount such effects here.

A multi-chamber Koi pool filter under construction.

The process by which this oxidation takes place is known as the Nitrogen Cycle. It takes place, not only in the filter, but also on all surfaces within the pond where a moving body of oxygenated water passes over a substrate. It happens on the liner, inside pipework and in every other conceivable place. It ensures that the end result is good, wholesome water for our Koi to live in.

Filter enemies

Having described the process, albeit so briefly, I can now point out that there are 'enemies' of our filter which will destroy it, or prevent it working to its full capacity. We should look upon our filter as a living being, rather than just an inanimate object. By so doing, we can then protect it in any way we can to ensure its efficient continued operation.

To attain full efficiency, the filter must have a good supply of oxygen, so we can ensure this, as many people do, by putting airstones at strategic places within the filter, especially if the system is of the multi-chamber type.

While needing ammonia from the fish and well oxygenated water to work and, indeed, survive, our filter does not need the chlorine from tapwater, whose very function is to destroy bacteria.

You will need a lot of tapwater for your pond to carry out weekly, or more frequent, percentage water changes. This is necessary to keep down the soluble organics in the water, to replace minerals taken out by the pond life, and to keep the nitrate levels within reasonable limits. You will also need to top up the pool due to evaporation in the summer, and for all sorts of other reasons.

This means that, at the very least, you must provide yourself with an activated carbon dechlorinator or, if your tapwater warrants it, a purifier unit. Any means of purifying tapwater is better than none; once you have a unit installed, you will wonder how you ever managed without it!

One point to watch, however, is that the purifiers at the top end of the range are thought to take out some of the essential minerals we actually require. It is recommended therefore that mineral replenishment be carried out by employing 'refresh' or 'montmorillionite'.

The biological filter must never be switch off for longer than the time it takes to carry out essential maintenance. If it is, then the bacteria, starved of essential oxygen, will start to die back, and when the filter is put back into operation, it will work at a much lower level of efficiency for perhaps a couple of days. A lot of dead bacteria and other accumulated nasties will also be flushed into the pond when we switch the pump back on again.

We must never use chlorinated tapwater to clean any part of the filter when carrying out maintenance. Particularly with sponges, we do not need to get the media 'squeaky clean'. The gunge, we don't need; but the bacteria we do!

Filters & medication

It is, of course, necessary to carry out medications on our pond from time to time to keep parasites or bacteria under control. It is maintained by some Koi keepers that such medication will do great harm to the bacteria in the filter. These keepers therefore switch off their filters for a number of hours to safeguard their 'biology' and, while this is done with good intention, more harm is done through lack of oxygen than would have been done by the medication.

It is also not true to assume that such medication will have degraded sufficiently in several hours to be innocuous to the filter bacteria. Formalin, for instance, takes about three days to degrade partially, and five days to clear from the pond system, so I see no benefit in switching the filter off for several hours.

The answer is to build the biological filter big enough in the first place so that its total biomass will withstand medications without appreciable 'die-back'.

It is worth pointing out here that a biological filter encompassing a large single chamber will stand up to medication much better than a multi-chambered biological design. This is because there is a more even distribution of bacteria throughout the available media.

Filter design

1. The biological stage should be designed so that it has between 1/3 and 1/2 of the surface area of the pond.
2. The pond water should be circulated through the filter once every two hours, and the water should have a residence time of about 20 minutes in the filter.
3. As much of the solids as possible should be separated from the water before it reaches the biological stage. This is done by providing a settlement chamber which can also take the form of a vortex chamber.
4. This settlement stage should be flushable to waste, as should be all other chambers in the filter.
5. The pond should, ideally, have a bottom drain (also flushable) feeding the filter.
6. The filter system should be designed so as to be 'gravity fed'. This means that it has the same water level as the pond. Water is fed to it via large-diameter pipes (one 4in [10cm] pipe per 2,000 gph [9,000lph] flow) and the pump is placed at the end of the system. The pump is actually trying to empty the last filter chamber which is then constantly replenished from the pond and through the filter under the force of gravity.

Filter maturation

When setting up a pond from new, the filter will not be mature. This should take about 20 days at summer temperatures; 30 to 40 days at around 55°F (c13°C) and a much longer period at below 50°F (10°C), if it will mature at all. It follows that winter time is a far from ideal season for setting up a new filter.

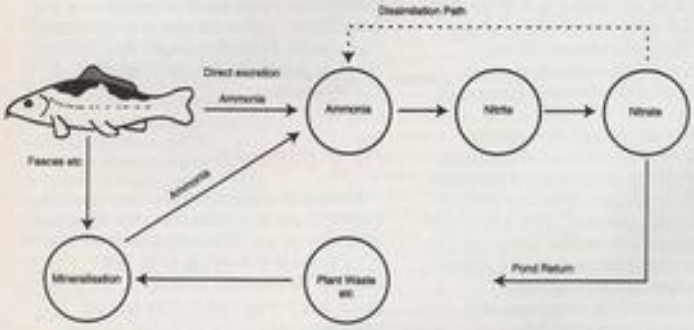
When maturing a new filter you should test for ammonia, nitrite, and pH daily, and you must change water to keep pollutants down to a negligible level.

When a filter is mature you need to test the water quality weekly; in the winter, test it monthly.

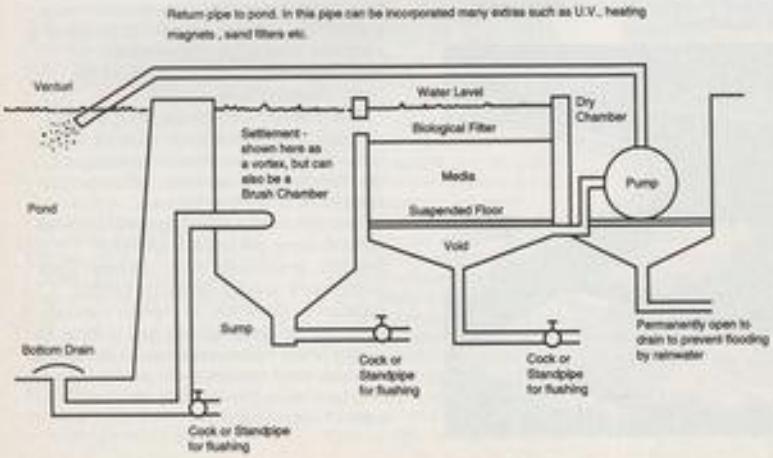
TO BE CONTINUED

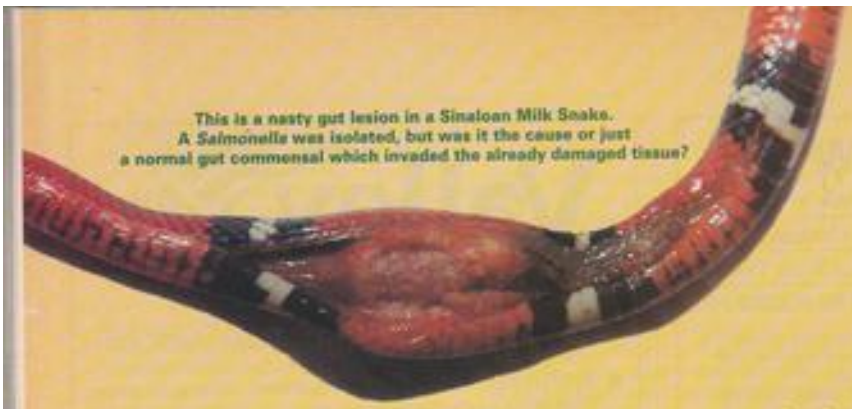
Next time I will go on to describe some of the effects ammonia and nitrite can have on Koi.

A BASIC GRAVITY FED KOI POND FILTRATION SYSTEM



THE NITROGEN CYCLE





This is a nasty gut lesion in a Sinaloan Milk Snake. A *Salmonella* was isolated, but was it the cause or just a normal gut commensal which invaded the already damaged tissue?

ZOONOSES

The first time I saw the term "Zoonoses", I immediately pictured a collection of animal nostrils! However, it turns out that this is a term to describe a group of diseases that people can catch from animals.

There are three ways of looking at the question of zoonoses. You could adopt the standard ostritch approach, i.e. bury your head in the sand and pretend that the problem does not exist. Secondly, you could go to the other extreme and adopt the 'total-avoidance' approach; this involves an oxygen tent! In other words, one can attempt to seal oneself off totally from any risk by not exposing oneself to any other species. One should also not cross roads, eat or even breathe! Thirdly, you could take a reasoned, rational approach, accepting that zoonoses do happen, but realising that the incidence is rare and that this can be further reduced by taking sensible precautions.

Anyone who saw "**Fish People**", the TV documentary on the aquatic hobby that has now been screened at least twice, will no doubt remember a certain actress discussing in vague terms the myriad "wriggly things" which inhabited her pond, which she was convinced represented a significant source of infection to people. Let's get one point straight — the most dangerous source of infection to one human is another human!

The average human is a seething mass of viruses, bacteria and other microbes which we then proceed to cough, sneeze, rub, flick, defaecate and urinate into our immediate environment. All of these microbes will be *human-adapted*, ie. able to live at 37°C (98.6°F), have various ways of out-witting the human immune system, and have the ability rapidly to colonise human tissue should they succeed in outwitting our protective 'shields'.

Defence review

In our defence, the human immune system is a complex, yet versatile, multifaceted 'task force', with a long memory and the means to mount a huge response at relatively short notice. It is certainly far more reliable and efficient than its fish, amphibian and reptile counterparts.

The average fish is also a seething mass of microbes, which it, too, is shedding into its immediate environment. However, these microbes are *fish-adapted* so that they do best at the temperature that the fish enjoy, way below the 37°C found in humans.

In addition, these microbes have been adapted, by evolution, to live in or on an aquatic organism. In essence, the same is true for amphibians.

The average reptile is another seething mass — yet, there is a significant difference. Although usually regarded as 'cold-blooded,' this is often far from the truth. Most reptiles possess a range of behavioural adaptations with one biological purpose in mind — to keep body temperature high. Even our native Common Lizard, *Lacerta vivipara*, manages to achieve its preferred body temperature (PBT) of 30°C (86°F) in our variable climate. Think how many days we get from March to September (when *L. vivipara* is active) when the temperature tops 30°C — not many, but *L. vivipara* manages it by a combination of time spent basking and adopting the correct posture to absorb maximum solar radiation.

The Common Iguana (*Iguana iguana*) has a PBT of 29.5-39.5°C (85-103°F). Therefore, if reptiles are kept correctly in captivity, these PBT's will be achieved, effectively removing the temperature barrier to cross-infection between reptiles and humans. However, there are still anatomical and physiological differences between the two that inhibit infection to the latter.

Further barriers to infection are the way in which we keep these animals. Fish, by their very nature, are kept in an enclosed environment, and so direct contact with them or their surroundings is minimal. The same is true of amphibians and reptiles (some Iguana owners notwithstanding!) whose vivaria form discrete microcosms within the home. Compare this with the interactions of the household members with their dog or cat, or, worse still, friends, relatives and neighbours.

In all cases, basic hygiene precautions eg. washing of hands following handling, should be sufficient to prevent any risk of infection, especially from our friends, relatives and neighbours...

The Green Iguana has a preferred body temperature of 29.5-39.5°C so it has some zoonotic 'potential'. However, there are several biological barriers which protect us from infection.

However, there are certain groups of people who are at a higher risk of contracting zoonoses. These are the very young, the elderly, people on immunosuppressive therapy, such as organ transplant patients, those on anti-cancer therapy, and HIV carriers showing signs of AIDS. In all these cases, the normal immune responses to infection may not be present, allowing diseases to develop which, in healthy people, would not even gain a foothold.

Zoonoses defined

Before I go on briefly to discuss some specific zoonoses, I feel it would help to define further what a zoonosis is. To be a true zoonosis, the condition must be:

① – A specific, recognisable disease or condition in humans, caused by a recognised pathogen whose source is a second, non-human animal.

② – The presence of this pathogen should be directly attributable to the presence of that second animal species.

③ – Further to (2), the second species should not be just another environmental source of contamination to humans.

IN PERSPECTIVE

Salmonella is often linked to Red-eared Sliders (terrapins).

In the face of scare-mongering statements regarding diseases picked up from pets, our 'resident' fish vet **Lance Jepson** knocks some commonsense into the subject and offers some useful easy-to-follow advice on how to prevent problems arising in the first place.

Photographs — unless otherwise indicated — by the author

Many of the 'zoonoses' associated with the 'lower vertebrates' are actually food-poisonings, or the result of eating uncooked flesh. Some Giant African Land Snails (*Achatina* species) of Far East origin may carry the nematode worm, *Angiostrongylus cantonensis*, an occasional cause of meningitis in Asia. However, one must eat a raw snail first, so the risk is considered negligible in the UK. Fortunately few hobbyists will be tempted to eat their charges(!), so this aspect will not be considered further.

Now let's turn our attention to some specific zoonoses.

1 Fish Tuberculosis

This is usually due to infection with *Mycobacterium marinum* or *M. fortuitum*, although other species are occasionally implicated. Fish TB is widely believed to be a much under-diagnosed disease. This is partly due to the wide range of symptoms that the disease can produce, causing confusion with diagnosis.

The Mycobacteria often infect the bowel and kidneys, allowing the excretion of the organism into the general environment. This is usually when the unfortunate aquarist risks infection, as the bacteria are able to invade cuts and abrasions in the skin to establish localised infections. The hands are the usual site of infection because these are the parts of the body most likely to be exposed.

Strains of TB bacteria isolated from fish grow best at 18-20°C (64.4-68°F). This usually limits the infection in humans to the skin surface at the extremities, such as fingers, where the temperature is low. Occasionally, there is some temperature adaptation into the region of 30-33°C (86-91°F) which may allow some further spread. This is usually along the lymphatic system, giving rise to multiple painful, raised and reddened lesions. More serious infections are very, very rare.

Treatment is usually straightforward by a combination of excising (cutting off) the lesion, plus appropriate antibiotics.

Infection can be avoided by wearing water-proof gloves, especially if there are abrasions on your hands, and the use of skin disinfectants if there is accidental skin contact.

2 Nocardia

Nocardia asteroides is another occasional cause of fish TB. The disease presents in a similar way to Mycobacterial infection in both fish and humans, although it is an occasional cause of pericarditis in humans (and cats and other mammals).

When it occurs, it is probably not a true zoonosis, as it is found in large numbers in certain soils, with the fish acting as just another environmental source of the infection to humans.

3 Salmonella

This zoonosis is often considered synonymous with terrapins, but in one as-yet unpublished study, up to 65% of a variety of captive-bred reptiles were found to be excreting Salmonellae.

If one considers that the majority of excretors are asymptomatic, ie. do not show signs of disease, that this carrier state may be life-long, and that the majority of serotypes (varieties) of Salmonellae isolated from reptiles are rarely, if ever, associated with human infections, then one begins to wonder if these bacteria may be regarded as normal parts of the gut flora in certain circumstances, and that they pose a minimal threat to the reptile keeper, *provided the keeper is hygienic.*

You could become infected with a nematode worm... but you'd have to eat this Giant African Land Snail alive... and even then, the risk would be slight.

Of course, there are some nasties, such as *S. typhimurium* which one is more likely to contract from a diarrhoeic calf or dog, than from a sick reptile.

For real nasties look no further than your fellow human. Consider the case of Mary Mallon, who was employed as a cook in New York between 1901 and 1914. Unfortunately, she was an asymptomatic carrier of typhoid (*Salmonella typhi*) and while working, was responsible for over 1,300 cases of typhoid fever. No wonder she was known as Typhoid Mary!

Although not associated with disease, Salmonellae have been isolated from aquaria. Again, as with reptiles, the serotypes found are not usually associated with human disease.

In both fish and reptiles, the source of the Salmonellae will be the environment of their country of export, mixing of individuals from different localities, and the feeding of contaminated foodstuffs.

Levels of Salmonellae can be signifi-▸

◄ cantly reduced by using efficient filtration in aquaria, and a regular routine of cleaning and removal of uneaten food, plus the usual hygienic precautions.

In humans, the classic signs of a *Salmonella* infection are a severe gastro-enteritis or a generalised septicaemic condition. In the case of gastro-enteritis, there may be such contamination of the immediate surroundings with the bacteria that swabs taken from anywhere in the household, including aquaria and vivaria, are likely to yield the *Salmonella*. In this situation, terrapins, in particular, are likely to be declared guilty, and rarely proved innocent.

4 Other bacteria

Aeromonas spp are ubiquitous in aquatic environments, be that river, pond or aquaria. Some are recognised pathogens of fish, amphibians and reptiles. *Aeromonas* bacteria have been found in human patients with diarrhoea and has been the cause of septicaemia in immunocompromised patients. In one case, a tendon infection in a child resulted from an abrasion associated with an aquarium — the child was already suffering from a form of anaemia.

Edwardsiella is known to cause disease in both fish and reptiles. There is one report of an infant in Belgium having *Edwardsiella*-associated diarrhoea. The same bacterium was also isolated from an Angelfish (*Pterophyllum scalare*) taken from an aquarium in the house. It was assumed that the infant had become infected via his parents' hands. As none of the fish were described as ill, it is entirely possible that they became infected from the infant via the same proposed route!

Pseudomonas spp, in theory, represent a zoonotic risk, although I can find no recorded cases linking an infection with the hobby.

Plesiomonas shigelloides has been isolated from one aquarium. In humans it can cause a gastro-enteritis or a septicaemic condition. Infection would be by accidental ingestion of contaminated water.

5 Wiel's Disease

Wiel's Disease in humans is due to infection with the spirochaete bacterium, *Leptospira icterohaemorrhagica*. It is a true zoonosis, but the source of the infection is not a fish, amphibian or reptile — but wild rats. Because of this, the main hobbyists at risk are those with outside ponds.

I know of one dealer who has possibly had Wiel's Disease following exposure to a dead rat found among some aquatic plants. However, as he had also received a bite from a monkey at around the same time, it may well have been Monkey Bite Fever (for which he was treated).

Infection with *L. icterohaemorrhagica* probably represents the most serious risk to humans of all the diseases mentioned.

ZOONOSES IN PERSPECTIVE

This is because:

① – The natural source is a mammal, and so it is adapted to live at 37°C in mammilian tissue — in this respect, we differ little from rats.

② – Leptospirae can survive for some time (up to several weeks), as long as their environment is damp. Drying rapidly kills these bacteria.

③ – Cuts and abrasions on wet hands provide easy portals of entry for the Leptospirae. In fact, they are able to penetrate intact skin as long as it is wet.

④ – Symptoms vary from a mild, flu-like fever and aching, to a very severe kidney inflammation and jaundice. Death may occur if treatment is delayed.

Fish TB is the most common zoonosis found in humans.

DR. R.R.M HARMAN (originally published in the British Medical Journal — Vol 300, 1990)

Fortunately, Wiel's Disease is rare and, despite all the above, *L. icterohaemorrhagica* is very susceptible to antibiotics, and to common household disinfectants in the environment.

One final word about Wiel's Disease. *L. icterohaemorrhagica* is included in the standard vaccination programme for dogs. There is no such vaccine for people — an indication of how uncommon this disease is in our species.

6 Pentastomids

These worm-like parasites are actually a degenerate form of arachnid distantly related to spiders and mites.

Pentastomids usually have an indirect life-cycle. The adults live in reptiles, where they mate and lay eggs. These are then passed out into the environment, where they are accidentally ingested by a small mammal, and in which they hatch and develop into an intermediate form. The life-cycle is completed by the ingestion of the mammal by the reptile, as prey.

Accidental ingestion from unwashed hands following handling or cleaning is possible, although development of the embryos to the immature resting stage is unlikely to cause problems in humans and would probably be of no consequence. Pentastomes will not reach maturity and breed in humans (for this, they need to inhabit reptiles) but will, in all likelihood, be walled off by the body with fibrous tissue until the parasite dies. AAP

PREVENTIVE MEASURES

1. Accept that zoonoses do occur and learn to recognise and avoid potential high-risk situations. Know your enemy!
2. Pay strict attention to personal hygiene following contact with aquaria and vivaria, or after handling animals. Avoid wiping wet hands across the mouth or eyes. If there is a risk of Wiel's, wash your hands with vinegar, as the low pH will kill the Leptospirae.
3. Cover up cuts and scrapes with water-proof band-aid or gloves.
4. Avoid using your mouth to start a siphon. How many of us haven't taken in a mouthful of water during that routine partial water change?
5. Pay attention to husbandry. Maintain clean, hygienic conditions in your aquaria and vivaria, as far as possible. This will prevent the build-up of excessive levels of bacteria, helping to reduce the risk of infection to both the keeper and the animals. Correct diet and husbandry methods will also reduce the stress on captive fish and reptiles, helping to promote their natural resistance.
6. Biological filtration may reduce the presence of zoonotic bacteria in aquaria by establishing an unsuitable environment in the substrate/filters and, possibly, by direct competition for nutrients etc. UV sterilisation will also help.
7. Pool owners especially, take care to store fish food in rodent-proof containers to discourage rats. Site bird tables away from ponds. If you suspect rats, consult a professional pest controller.
8. Tackle any disease outbreaks promptly. In the case of Fish TB, euthanasia (humane destruction) of affected fish may be required, as treatment is often unrewarding.
9. If you have any worries at all, consult your GP. If you belong to one of the high-risk groups, take extra-special care and, preferably, ask someone else to deal with your animals.

WATER'S EDGE

BY DICK MILLS

Pond shopping in comfort

Who wants to go out and about on cold, dark days?The new **WATER GARDENING CATALOGUE** from **Bradshaws** neatly provides the solution and saves you time, trouble (and probably money) into the bargain.

Put your feet up and browse through this packed list of everything for the pond; if you're not sure about what will suit your exact requirements, then their telephone sales people will talk you through things so you get the right product. Complete your list - you can 'FREEPOST' your needs, or even 'phone or fax them - then sit back and wait for the goods to arrive.

In 1995, the already comprehensive lists will be considerably expanded to include aquarium products, books and equipment too.

Details from: **BRADSHAWS, Nicolson Link, Clifton Moor, York YO1 1SS Tel: 0904 691169; Fax: 0904 691133**

Dangerous time bombs

While there may be a tiger in your tank, there may well be a time bomb in the pond as well, timed to explode next spring.

As you spend the winter in warm, comfortable surroundings, in the pond's depths, sinister nutrients and phosphates are building up trouble for next spring when warm sunshine releases algae into rapid growth, feeding on this abundant foodstore. The result is a pond with murkiness second to none.

To stave off this occurrence, treating the pond in the new year with O'CLEAR, from **AQUA COMPANY**, will ensure that phosphates will be blocked and sediment rendered safe, and the water's natural balance will be restored. As O'Clear has a long-term effect, you can look forward to clear pond water for the start of the summer.

Give your pond a really useful New Year present.

Details from: **AQUA COMPANY LTD, Abbott House, 14a Hale Road, Farnham, Surrey GU9 9QH. Tel: 0252 712307; Fax: 0252 712308.**

Emergency air

Winter time is the very time you don't want power cuts, but it does happen. Fortunately, the average-sized tropical tank doesn't lose much temperature in the powerless period, but for those with biological filtration systems, the loss of oxygen could be crucial. You can keep those aerobic, nitrifying bacteria alive and working by having a BATTERY-OPERATED AIR-PUMP from **ROLF C HAGEN**, on hand.

Of course, you don't have to wait for a power cut to use this handy air-pump; you can use it

for easing fishes' comfort during transit, helping them to avoid respiratory stress during Open Shows on hot summer days - or even keeping a small collection of *Daphnia* alive on the way back from the local pond. The pump comes fitted with a belt clip (so you won't lose it) which, no doubt, will also help clip it to the tank too.

Details from: **ROLF C HAGEN (UK) LTD., California Drive, Whitwood Industrial Estate, Castleford, West Yorkshire, WF10 5QH Tel: 0977 556822; Fax: 0977 513465**

Maxi-products

GLASS ART POOLS announce the release of the following new products.

MAXISEAL is a moisture-cured polyurethane which forms a non-porous flexible plastic seal for concrete ponds, which, while sealing cracks and so on, will also prevent lime leaching too.

MAXIMEND is a flexible glass fibre repair compound. The unique formulation is easy to apply to any holes, cracks or splits and will bond to most surfaces, including metal, wood, glass-fibre and ceramics.

Following the successful launch of MAXISOIL last year, this product has now been given an additional granular medium to ensure a higher biological equilibrium which results in healthy plant growth. MAXIPOOL BIO MEDIUM has an open texture with large inner surfaces. It can be placed on the inside of the pond, and its balanced amount of minerals and trace elements are beneficial for waterlily and bog plants; it can also be used as a biological filter medium.

But enough of ponds; the fish aren't forgotten either, with the introduction, for 1995, of KOI FOOD, POND FOOD and GOLDFISH FOOD. Very little waste is produced, making for clear water and less filter maintenance and, thanks to the latest nutritional chemistry, the food has a 97% digestibility with a very high energy content.

Details from: **GLASS ART POOLS, Durrance Farm Works, Stewkley Road, Leighton Buzzard, Bedfordshire LU7 0UU., Tel: 0525 240533; Fax: 0525 240154.**

New aquarium range

A new total aquarium system and a range of small aquariums has been announced by **TAHITI.**

The PALM ISLAND AQUARIUM KITS are smart, feature-packed systems supplied in a range of options to suit all requirements and financial abilities, while still representing excellent value for money. Now available in four lengths and three heights, the options are: aquarium alone, or with hood, with hood and base, plinth and full lighting; soon, full heating and filtration options will also be announced. Aquarists should note that other base plinths are incompatible with this system.

At the more modest end of things, the new FIJI represents the best range of small economy aquariums ever produced by the company, with lava black textured one-piece cover tube/cable access and an anti-drip channel.

Details from: **TAHITI AQUARIUMS, Aquarius Centre, Queens Road, Hurst Cross, Ashton-under-Lyne OL6 8EW. Tel: 061 339 3131; Fax: 061 343 4439.**

Maximal aquarium enjoyment

The MAXIMAL range of aquarium filtration systems from **MEININGER** are different in design concept to the models generally seen.

The BIOLOGO is a high-performance air-operated biological system; one immediate difference is that you can see it, as only the 3cm deep locating chamber sits beneath the substrate. The vertically-mounted filtration pods feature the new Maximal Cylinder. Here, synthetic biomats are wrapped around a central hollow core which, in turn, can be filled with either ceramic pieces, or gravel, to greatly increase the biological action.

An extra removable cartridge chamber can be used in conjunction with the Biologo system to accommodate any special media you may want to use, ie zeolite, activated carbon, peat etc, without disturbing the Biologo system. Being 'exposed', the filter cartridges can be cleaned easily; a 2-3 months period is suggested. Additionally, being air-operated, there are no impellers to wear out, and the system can be extended as, and when, your needs arise.

The air-operated VARIO is a bio-pond filter specially designed to provide beneficial surface agitation. It can be operated vertically or horizontally in the pond, it sinks when requiring cleaning, and can even be used with a centrifugal pump by simply using a connecting hose.

The BIO-ACE is an air-operated external filter which has the facility built into it for connection to CO_2 injection systems. The bio-

Continued on page 68 ▶

CULTURED PLATY SECRETS

HARRY GRIER/FLORIDA TROPICAL FISH FARMS ASSOCIATION

This Rainbow Sword Variatus Platy clearly shows its Swordtail ancestry.

Cultivated varieties of Platy — for all their beauty — are often not what they seem, as **Derek Lambert** reveals.

Platies are among the top selling fish in the aquarium hobby today, a position which their lovely colours, peaceful temperament and general hardiness more than adequately justify. The creation and propagation of these pretty cultivated fish is far more difficult than many aquarists realise, however, but the results are well worth the effort.

In the wild, Platies are found in a wide variety of habitats, including large rivers, streams, ditches and stagnant pools. One common factor in all these habitats is that the fish will generally be found among plants and tree roots. This liking of heavy plant cover is often assumed to be because Platies eat plant material and algae, whereas the real reason is because the small insects and crustacea which Platies much prefer to eat, are found here. Other common factors which link all these habitats is that they tend to be in the lowland plains and contain hard, somewhat alkaline, freshwater.

Looking at the wild habitats Platies come from gives us a clear profile of the sort of ideal conditions which suit these fish. Their aquarium should contain some plant cover, hard, alkaline water, and be maintained at 75-78°F (c24-25.5°C). Their diet should contain some live foods and a good-quality flake food, ideally, a carnivore flake, rather than a herbivore flake.

Breeding Platies

A female Platy in good condition will produce broods of young on a monthly cycle. The exact number of days between broods varies according to temperature and lighting. The number of babies born will also vary, from about 10 for a small female having her first brood, up to in excess of 50 for large adult fish.

In a normal community aquarium, these fry will be gobbled up by the other fish in the tank, so if you want to save them, you will have, either to set up a maternity tank with plenty of plants, or place the female in a plastic trap.

Personally, I dislike these contraptions because most of them are too small for the fish's comfort and often cause the gravid female stress; this can make her give birth prematurely.

Another factor which needs to be taken into account is where are the babies going to grow up? If you do not have a spare aquarium which you can use as a maternity tank for your gravid female, then you are not going to have one for the babies to grow up in.

Maternity rearing tank

Assuming a maternity aquarium is available, the gravid female should be placed in this several weeks before she is due to drop. During the last few weeks of her pregnancy, you will be able to give her the best food available, which will help build her strength up for the birth and also feed the developing embryos. She will also be free from the unwelcome attentions of over-zealous males.

The babies will usually be born in the early hours of the morning, so it is important to check your maternity aquarium as soon as you can after daybreak. At first, the newborns will stay on the bottom, hiding among the plants which have been placed there for just this purpose.

After a few hours, they will start to swim up to the surface, and this is the danger period. If the female is well fed, she may leave the babies alone, but if she is hungry, she will kill and eat many of her own babies. For this reason, it is best to remove her from the maternity aquarium as soon as possible after she has given birth.

The fry can then be fed on newly hatched brine shrimp, microworms and a good-quality fry food. Ideally, all three of these should be fed during the course of a day. Care must be taken not to foul the tank, and regular partial water changes must be carried out each week. Filtration should be in the form of a small bubble-up sponge filter, rather than a power filter, which creates too strong a current for the small fry and may even suck them in.

If the brood is a large one, it must be split into several tanks for rearing. Assuming the aquarium is 12in (30cm) from front to back, I allow 1in (c2.5cm) of length per baby. So if the aquarium is 24in (60cm) long, I only rear a maximum of 24, up to 1in long, babies in it.

After that, they will usually be showing signs of sexing and can be split into two aquaria, with males in one, and females, plus unsexed males, in the other. This separation of the sexes at a young age is essential if you are planning to produce your own strain of Platies.

To do this, you will have to keep your female Platies virgin until the males have matured sufficiently for you to see which are the best fish. Then, all you have to do is select the male and female with those characteristics closest to those you want and breed from them.

Fancy types

At present, there are three fancy fin types known in the genus *Xiphophorus* (Platies and Swordtails). These are **Hi-fin, Lyretail** and **Plumetail.** Platies have been bred in all three fin types, and both the Lyretail and Plumetail finnage types have been combined with the Hi-fin type. I have not, however, come across a fish with both Plumetail and Lyretail finnage. It may be that

The 'Standard' Platy — the Wagtail ... except that it's not a 'pure' Platy (see text for details).

LINDA LEWIS

Like many other 'fancy' genes, the one producing Lyretails is dominant.

DEREK LAMBERT

such a combination is impossible or, alternatively, it may have just not been produced as yet. Time will tell, since I know of several aquarists who are trying to produce such a combination at the moment.

The gene which produces **Plumetail** finnage in *Xiphophorus* is a dominant gene, so if you select only fish with this characteristic to breed from, this variety will eventually breed true. Modifiers affect the extension of the caudal fin, so it comes to a fine point, or is a widely branching plume. In Germany, the fine pointed 'Pintail' form is preferred, whereas, in the USA the plume is more desired.

The gene which produces **Lyretail** finnage is also a dominant gene which could, in theory, be made to breed true, if only Lyretail parents are bred from. The problem with this, however, is that male Lyretails have a greatly extended gonopodium (the anal fin used in mating) which is incapable of copulating with the female. A normal fin male, therefore, is crossed with a Lyretail female, and only half the babies are Lyretails.

The **Hi-fin** gene is also a dominant gene which will not breed true. In this case, the reason is because those embryos which have inherited the hi-fin gene from both their parents, fail to reach maturity. In most cases, they die while they are still embryos, but the few which are born, usually die before they have become sexually mature. Once again, modifiers can affect the shape of the Hi-fin and cause it to be thin and rather poorly developed, or large and widely spreading.

Endless possibilities

These fancy finned varieties can be bred in any of the multitude of colour varieties available — these number in their hundreds now, if not thousands. So far, over 130 wild colour patterns are known in *Xiphophorus maculatus* (the **Southern Platy**) and dozens more are known for *Xiphophorus variatus* (the **Variable or Sunset Platy**). Since these can be combined in many different ways and *Xiphophorus helleri* (the **Green Swordtail**) can also be used to cross into these two species and their hybrids, you can see that the possibilities are just about endless.

The Plumetail has an appropriately branching caudal fin.

Hi-fins are never genetically pure.

HARRY GRIER/FLORIDA TROPICAL

While it would be impossible to deal with all of the colour forms in the hobby in this article, I would like to highlight the one which was, and still is, one of my personal favourites.

One of the oldest cultivated Platies in the hobby is the **Wagtail Platy.** In this form, all the fins and the lips of the fish are black and the body is yellow or red. In the UK hobby, this has been called a "**Standard**" **Platy**, as opposed to one of the more recently created hybrid forms such as the **Mickey Mouse Platy**.

In those early days, much less was known about the origins of these cultivated fish. Now we know that the **Wagtail Platy** was ated by crossing a **Southern Platy** (with the Comet — also called **Twin-bar** — pattern in the tail) with a **Green Swordtail**. Modifiers from the Swordtail changed the expression of the Comet gene to that of a Wagtail, hence, all Wagtails, by their very nature, must be hybrids.

Conversely, the **Mickey Mouse Platy**, with its one large spot and two small spots in the caudal peduncle (looking just like Mickey's head) is, in fact, very typical of many wild Southern Platies and is almost identical to one of the fish the species was described from way back in 1866! **AEP**

DISCUSSIONS

MEETING THE PIGEON BLOOD CHALLENGE

BY STEVE DUDLEY

Photographs by the author

The perfect Pigeon Blood Red family - a healthy pair with a large brood of healthy fry.

STEVE DUDLEY

As promised last month in my **Pigeon Blood Bonanza**, here are my personal experiences trying to breed Pigeon Blood Reds successfully.

After months of conditioning adult Pigeon Blood Reds with white worm, spinach and Phoenix 2000 Discus Food, the time had come to start breeding them. For months I had been told that this was not possible due to the fry not being able to feed from their parents.

I was almost beginning to believe the theory myself until I spotted a new pair in my stock tanks. They were therefore moved to a breeding tank and subsequently succeeded in raising their own youngsters without any problems.

Prior to this event, I had set up five other breeding pairs. Every week they spawned, produced fry and lost them, so I decided to cross them with other varieties. This turned out to be successful, but on each occasion, the fry ended up grazing from the 'normal', darker fish and never went near the Pigeon parent.

At this point, I was presuming that the light coloration of the Pigeon Blood parents prevented the fry from being attracted to them, as these adults were unable to adapt the dark (or even black) colour of their ancestors.

Key questions

If you look closely at this strain, it is quite evident that no transverse black bars are apparent, except at the base of the caudal fin. This could be due to in-breeding of the strain at an earlier stage some three years ago when black mottling appeared over the body; this is still quite apparent in some specimens seen today. So, have the transverse bars broken up at the gene-stage to create the mottling effect?

I have also noticed that some fish have black pectoral and caudal finnage, which is quite spectacular. Could this be associated with the disappearance of those transverse black bars?

When Discus, in general, are stressed or uncomfortable, they often show dark coloration, yet, it is not possible to detect this in Pigeon Bloods, which can leave you in the dark (as it were!) when trying to distinguish the mood of the fish.

All these factors pointed me in the same direction as many other keepers, that Pigeon Bloods could not raise their own young and therefore had to be fostered by darker varieties. That is, until I had my first success.

Further theories

It was then that I decided to look at another aspect, which included precise water parameters, and the understanding of hormone changes in brooding Discus.

We all know that Discus fry feed from the sides of their parents, but they first need to be attracted, either by sight or by chemicals produced by the parent fish. Dark coloration is the main visual signal, but as Pigeon Blood parents can't darken, some other way of getting fry and parents together must be found.

My approach was to lower the level of the water to the height of the largest parent and hope that the fry would eventually find food secreted by the parents. This, fortunately, worked in most instances.

Darkening is just one of the factors that attract fry to brooding parents. Another is, in principle, similar to a situation found in humans.

Expectant mothers, as we know, are capable of producing milk. This is brought on only by hormonal changes during pregnancy and not at any other time.

If we were to apply this principle to Discus, there is some similarity, as they, too, in a manner of speaking, produce 'milk', which migrates to the surface of the body.

This is often seen as a white bubbly film on the epidermis, often falling away in long strands. The only way in which this nutritious secretion can be produced is by hormonal changes within the brooding Discus.

Water quality

I am now convinced that chemical attractions produced by Discus are a result of hormonal changes, and if these are not prooduced when fry become free-swimming, then they will probably perish. It is quite possible that all Discus have the capability of attracting fry, so if a pair fail to do so, this may mean that the chemi-

PECIAL

STEVE DUDLEY

Take a close look at the fry. Some are dark! So ... are they PBR's like their parents ... or what? We'll have the answer in a couple of months time once they've grown a little bit larger.

Once the fry are over the three-day period, you can begin to feel sure of success.

I only know of one other breeder to have accomplished the successful rearing of PBR's. Gary Coburn, a breeder from Manchester, managed to achieve this using foster parents which provided the fry with a dark 'target' area for feeding. Like me, he had had problems trying to rear Pigeon Blood fry on their own natural parents.

To date, as far as I know, both our successes are 'firsts' for the UK. They'll probably not be the last 'firsts' either!

cal odours might be blocked by pollutants in the water which may create a barrier.

The pH is of vital importance if you have a difficult brood of fish. If it is higher than pH7, then bacteria could destroy beneficial food supplies. I have always noticed that brood-rearing fish produce more slime coating at lower pH values, with strands floating everywhere, thus making plenty of food available to the hungry fry.

Water changes are also very important with regards to PBR's as they do not like aged water. In my brood tanks, 50% of the total volume is changed on a daily basis to ensure low levels of contaminants.

◀ Continued from page 63

WATER'S EDGE

logical filtration area is so large there isn't enough room on the page for the number of '0s' required fully to describe its area - although the 5 sq metres in a 33cm high body might be a starting guide. It is economical to run (a 4 - 7 watts air pump is recommended) and it can also be used in conjunction with protein skimmers in marine systems.

Details, and catalogue, from: **MEININGER TROPICAL FISH CENTRE, 103 Welland Vale Road, Corby, Northants NN17 2AW. Tel: 0536 203194; Fax: 0536 46019**

Wheels, magnums and . . . penguins?

OK, penguins first then. Of course, you will have already guessed that this is the name of a piece of aquarium equipment (from **MARINELAND AQUARIUM PRODUCTS**) rather than a bird or a chocolate bar; PENGUIN POWER FILTERS are - it is claimed - the most advanced 'hang-on' filters available to the hobby.

They're self-starting (prime with only a cupful of water) even after a power failure or shut-off. The one-piece filter body and motor assembly mean absolutely no leaks, and the impeller is the only thing that moves.

A disposable, pre-assembled RITE SIZE CARTRIDGE comes with every Penguin; these contain high-quality MAGNUM ACTIVATED CARBON, are easy to change and, because of their unique design, won't be bypassed by waterflow. Penguins come in four sizes - MINI (378 lph), 110B(415 lph), 160B(605lph) and 300B (1,135 lph).

MAGNUM is the name of the range of new CANISTER FILTERS. The bottom-mounted motor makes for easy priming and starting; the lift-off canister allows fast, simple media changing and cleaning. Like the Penguins, water bypassing the filter media is eliminated and there's only one moving part - the impeller. A feature of the filter is its dual use facility: use 425 gram carbon/media container and replaceable filter sleeve for fulltime, continuous use; replacing the media with Micron Cartridge polishes the water and cleans up fast (diatomaceous earth is not required).

Magnums come in three sizes:

220 (830lph, includes carbon/media container and filter sleeve)

350 (1325lph, includes water polishing micron cartridge)

350 Deluxe (includes quick-disconnect valves, micron cartridge, carbon/media container, Magnum activated carbon and flexi-brush)

A HOT MAGNUM 250 is different (HOT=**H**ang **O**n **T**ank - geddit?) It was voted best New Aquarium Product by the Pet Industry Distributors' Association in the US, and features snap-lock inlet and outlet tubes which eliminate all hoses. A quick-release cover makes installation and servicing easy.

All accessories are included and it can also be used as a dual-use filter like its relations.

If you think of a water-wheel mounted on the side of the tank, then you've got the physical concept of BIO-WHEELS. Powered by any brand of canister filter or powerhead, the rotating PRO BIO WHEEL alternately subjects its aerobic bacteria to wet and dry conditions, making for more efficient (and less tank-oxygen depletion) than the normal sub-gravel filter. Bio Wheels are suitable for freshwater and marine aquariums.

Details of Marineland Aquarium Products from: **CAGEX ACCESSORIES, Bury Farm, Pednor Road, Chesham, Buckinghamshire HP5 2JU Tel: 0494 786759/791584; Fax: 0494 791617**

Green food for thought

Spirulina is the basic ingredient in two new foods from **TETRA.** Not surprisingly, Suckermouth Catfish were both the inspiration and the target for PLECOMIN, whose name really explains it all. Similarly, SPIRULINA KOI STICKS are also an understandable further use of this algae-type food, so vital for fishes whose dietary needs include mandatory vegetable content.

Look out for Tetra's new AQUARIUM COMPOST too, a sign of extending the business to all parts of the aquarium scene.

Details from: **TETRA, Lambert Court, Chestnut Avenue, Eastleigh, Hants SO5 3ZQ. Tel: 0703 6205000; Fax: 0703 629810.**

AllClear beats the block

The claims of water purifiers, in removing various harmful components content in the water, can be as complex as a technical report on a new car, or as dense as some of the 'small print' on most sales agreements. Going for the smallest number of pollutants, coupled with the highest gallanages, may seem to be the deal, but not always so.

Faced with reported shortcomings in performance from some systems where the carbon block component became blocked only a fraction into the expected 'cartridge life', **ALLCLEAR** has fully researched the problem and, in a nutshell, does not use carbon block materials in their own brand of water purifiers. So much for the 'behind the scenes' work; the more obvious 'front of house' results show a new development in products.

New products are divided into two groups: large systems (4.5 in diameter cartridges, either 10 in or 20 in high) where either large quantities are to be processed, or small quantities processed more quickly, and 2.5 in diameter, 20in high cartridges for more normal use. A range of four different sizes is now possible.

The suggested life-time ratings are based on the reduction of chloramine, free chlorine, pesticides, herbicides, molluscicides and lesser dissolved metals; built-in, up-gradeable systems allow for full 'metals systems' (removal of more difficult metals) to be achieved from the basic, less expensive systems. An upgrading service is also obtainable which can be applied to non-AllClear makes of purifiers. Dissolved iron is yet another pollutant which can be removed, but results differ according to whether hard or soft water is being treated. AllClear offer expert 'before you buy' advice.

New systems such as the 'D' and 'M' ranges are known to have the ability to reduce Fluoride but precise test figures have yet to be finalised.

All models come with hosetails, full cartridge set and bracket. System DL3 is available from stock, DL3/20 ML3/20 are supplied to order. Replacement cartridges, extra pre-filters and extra metals cartridge are all readily available.

Details from:

ALLCLEAR WATER PURIFIERS, 59 Hartswood Road, Brentwood, Essex, CM14 5AG Tel: 0277 214911; Fax: 0277 201740.

TRADE "TALK"

OFI (UK) talk

① Disease Inspectorate booklet

In line with the emerging principles of the Citizen's Charter, the **Ministry of Agriculture, Fisheries and Food (MAFF)** has issued a booklet entitled *The Fish Disease inspectorate and You*. In eight pages of A4, the ministry provides an overview of the service standards and codes of practice for enforcement. The booklet has been distributed to all registered fish and shellfish farmers and import licence holders.

Keith Davenport, chief executive, remarked: "This is a very useful and timely document and I would encourage everyone involved with the ornamental fish industry to obtain a copy".

② Hobby helps conservation

The continued installation of garden ponds helps to replace natural habitats which are being destroyed. It is estimated that in the three years between 1987 and 1990, the percentage of households owning garden ponds rose from eight to 11, representing an increase of 750,000 in the number of potential habitats for amphibians and water-based insect life.

Further positive contributions made by the ornamental fish-keeping industry outlined by OFI(UK), include the fact that research in the Amazon region shows that a buoyant ornamental fish trade reduces pressure upon local people to slash and burn the rain forest. Rather than clearing the forest for crop planting, they are able to sell live fish to provide cash to buy food.

Live reef fish imported for the aquatic trade generate some 27.5% more revenue than dead fish imported for the food trade.

The organisation adds that the annual import of marine fish into the UK could be supplied by harvesting **less than 10 grammes of fish from each of the 400,000 square miles of the world's coral reefs**. Reef species available from retail fishmongers sell for around £10,000 per tonne. In comparison, the import price of reef species for the ornamental fish industry equates to £275,000 per tonne.

It is also reported that ornamental species are generally caught by hand, rather than by 'industrial' techniques.

Fish courses for '95

A limited number of spaces is still available for a series of short courses for aquarists at **Sparsholt College, Hampshire.** The two-day courses take place in March and cover Water Chemistry (**13/14 March**), Basic Water Quality, Maintenance and Filter Systems (**15/16 March**), Fish Anatomy, Physiology and Ecology (**20/21 March**), and Fish Disease Management (**22/23 March**).

Fees are just £100 per course, including lunch and light refreshments; discounts are available for attending two or more courses (10.30 am start each day).

The courses are ideal for those seeking to develop a career in the ornamental fish industry, as well as for dedicated hobbyists. In some areas, these short courses will also go towards an **Animal Husbandry Certificate,** which is needed to obtain a Pet Store Licence.

For information and enrolment contact: **Fiona Fielder, Short Courses Administrator, Sparsholt College, Hampshire, Sparsholt, Winchester, Hants. SO1 2NF. Tel: 01962 797276.**

'95 ZOOMARK makes its mark

Over 400 exhibitors from around the world are reported to have booked their space at the sixth exhibition of products and accessories for pets, **Zoomark'95** (Fiera Milano Halls Milan, Italy, **24-27 March**).

During the four days of the show, visitors will have the opportunity to see some of the pet industry's largest companies in the world, exhibiting petfoods and supplements, cages, equipment for cats, dogs, birds, rodents and other animals, aquaria, and equipment for vets and pet shops, as well as specialist literature and services, associations and pet healthcare products.

Exhibition space has been enlarged to over 11,000 square metres nett, and covers five halls. For information contact the organisers: **Vimax srl, Via Rezzonico 23, 22100 COMO, 4 - Italy. Tel:+39 31 30 10 59. Fax +39 31 30 14 18.**

NATURALIST'S NOTEBOOK

BY ERIC HARDY

Crayfish protection plan

Our native freshwater crayfish has long been endangered by a fungus 'plague' imported with American and other alien crayfish. The Government's **Joint Nature Conservation Committee** has now planned 'no-go' areas where our White-clawed or Atlantic Stream Crayfish will alone be allowed to exist.

Scotland has only one known population, in a limestone loch in Sutherland. Welsh colonies are in the east, chiefly in calcareous streams. None of the alien crayfish is yet known in Ireland, but the American Signal Crayfish is widespread in England and Wales, including Anglesey and the Isle of Man. The Narrow-clawed Turkish Crayfish is common around London.

'No-go' areas where keeping alien crayfish would be under stringent licence include all Scotland, Northern Ireland, Northumberland, Yorkshire, Northwest England, and Severn, Trent and Welsh national river areas. Also, parts of East Anglia (Welland, Wensum, Bure and Yare), Southern (Great Stour, Itchen and New Forest), Wessex (Avil, Tome, Parrett Cary, Brue, Axe and the Somerset Levels) and the South-west (Taw, Exe, Otter, Axe and East Lyne).

The controls cover petshops and aquaria as well. The scheme is based on areas mainly free from the crayfish 'plague'.

Crayfish-farming will also be revised, and it will be an offence to allow alien species to escape. In addition, there will be control on anglers using crayfish for livebait.

MAFF's river scheme

The **Ministry of Agriculture's** new habitat scheme should benefit several rivers. Two salmon and trout-spawning streams on the Ribble near Clitheroe — Swanside and Inges Becks — and well known Shropshire waterfowl-meres at Crosemere, Fenemere, Berrington and Betton Pools — are specially to encourage their wildlife by Government Set-Aside payments to local farmers.

In Wiltshire, the River Avon above Netheravon and the rivers Wyle and Nadder with their tributaries near Salisbury will aid their trout, dace, grayling and otters by better protection and new pilot habitats along their banks, as buffers to agricultural areas on these chalk rivers.

Annual payments will range from £195 to £525 per hectare.

Steps are being taken to protect our native freshwater crayfish from 'alien' species such as this beautiful Australian introduction.

Waterfowl news

Even at the end of July, two Ospreys fished the Malltraeth Estuary in Anglesey, a new RSPB reserve which plans to increase its reed-bed to encourage Marsh Harriers, Bitterns and Bearded Tits to nest there again.

Not all waterside birds are of good behaviour. One heron in Knowlsey Park in July ate 14 young Mallard. They often prey on Moorhens and Water Rails, as well as rats and Grey Squirrels.

Kingfishers increased widely after recent mild winters took less toll of their numbers, but England's second biggest nesting colony of Black-necked Grebes, on Woolston Eyes, at Warrington, was destroyed by drainage of their water last year.

Pond pros & cons

How often do garden ponds drown birds? Several Barn Owls have met such a fate over the years, perhaps seeing their reflection and attacking it. A friend, for the second year, brought me dead swifts found in a water tank in a cockloft of a house where they nest. Hedgehogs, too, are sometimes drowned in garden ponds.

MAKE YOUR POND SAFE!

But garden ponds serve a more useful purpose as bathing water for birds like Blackbirds, Robins, occasional Tawny Owls, even the raiding Sparrowhawk. Herons are the least welcome visitors and difficult to keep away for long, even with model heron scarers on the bank, lowering the water level a foot or so, filling the pond with submerged plants for fish to hide in, or stretched transparent plastic netting just under the surface.

Nature Notes

1 The Mediterranean Gecko, *Hemidactylus turcicus*, sometimes called the Turkish Gecko, is extending its range along the north-east gulf coast of the USA. Normally, this spotted, reddish-brown gecko occurs from North Africa to Kenya and India. It has also been introduced into Mexico.

2 Adders are well known on Welsh heather moors facing south; but it is a fallacy that they aren't in Anglesey. In the August heatwave, we found one in the Bell Heather flowering so well near Moelfre.

3 At Valley, in Anglesey, experimental culling of the increasing American Ruddy Duck was started the other year. A national nesting survey of this troublesome bird was conducted in Britain this summer. Its British population is spreading to the continent and interbreeding with the native White-headed Duck. The hybrids could well replace the few stocks of White-headed Ducks if this is not stopped. There is some sentimental opposition to plans to extend the cull nationally for these white-cheeked, cock-tailed duck with blue bills make attractive pond pets.

4 Stoats are a predatory problem in Anglesey where this year they wiped out the famous terns of Plas Cemlyn reserve and no Roseates now nest in Wales.

5 Grass Snakes were abroad on Cheshire's Wybunbury Moss, but no longer the Adders I recorded there in the 1950s.

6 Foreign Water Hawthorn still flowers annually in St Helen's Canal "Hotties" in the town centre, once warmed by cooling water from nearby factories.

7 Emperor Dragonflies bred at Mere Sands reserve near Rufford, and reappeared on Formby Cabin Hill pool on the dunes, and at Wigan Flashes.

8 Now an uncommon flower in south Lancashire waters, Arrowhead proliferates along the Appley Bridge Canal, near Wigan.

9 Sweet Flag is now abundant in Knowsley Park's big lake.

10 Marsh Helleborine, appearing at Mere Sands, brought its orchid list up to six species.

SOCIETY WORLD

'GROCKLEMANIA' RETURNS

Isle of Wight AS reports a great deal of interest in this year's 'Grocklemania', to be held from Friday 26 May to Sunday 28 May at Belgrave Hotel, Sandown, Isle of Wight.

One of the highlights of the event will be the final of the 'Aquarian' Aquaclub Quiz. The company will be fully represented at the event as part of its celebrations of the 20th anniversary of the 'Aquarian' Advisory Service. Details from: Paul Corbett, Isle of Wight AS, The Orchard, Gatcombe, Isle of Wight PO30 3EF. Tel: 01983 520809.

From Gloucester to Chester

Gloucestershire AS is planning a trip to Chester Zoo, for a behind-the-scenes look at the aquarium and rare breeding programme, on **Sunday 26 March.** Further information is available by contacting Gloucester AS publicity officer **Stewart Evans. Tel: 01242 527520.**

Euro Fair in demand

Enquiries from the trade for this year's **European Aquatic Fair** (Queensway Halls, Dunstable, **1-2 July**) are reported to be well in excess of those present at last year's event.

Show co-ordinator **Phil Dean** remarked: "So far, all the leading companies have indicated that they will be attending. Sponsorship has also been forthcoming and the show will be larger than last year."

Space has been increased to over 18,000 square feet, and additional attractions at this year's event include hot food served through snack bars, an extra licensed bar, and the extension of parking space for the trade.

Paul Dean added: "Interest in reptiles is riding high and many reptile traders and clubs are also attending, while the Bonsai hobby will be represented again this year, following its enormous success in 1994."

For information, contact **Paul Dean** by telephoning **01734 701461.**

Mills at Hemel

Newly-formed **Hemel District AS** plays host to a talk by *A&P* correspondent and author **Dick Mills,** on **15 January** (3.45 pm) at the 1st Hemel Hempstead Scout Hut, Queensway, Hemel Hempstead. Doors open at 3.15 pm; admission is 25p and includes light refreshments.

The society meets on the second Sunday of each month, between 3.30 pm and 5.00 pm, and has been formed to serve aquarists mainly in the Hemel Hempstead and surrounding areas. Among the aims of the society are the promotion of good fish husbandry and the encouragement of friendship and understanding between fishkeepers of all experiences and ages. The society is affiliated to the **A of A** and **FBAS.**

Cost of annual membership is only £3.00 for adults, £5.00 for a partnership, and £6.00 for a family .For under-16s, membership is just £1.00.

Details are available from **David Bradbury, Membership Secretary, 95 Bayford Close, Hemel Hempstead, Herts HP2 7NA. Tel: 01442 233316.**

First cichlid meeting

Twenty cichlid enthusiasts attended the inaugural meeting of the **South Coast Cichlid Group,** which meets on the first Friday of every month at St Nicholas Church Hall, Portslade, East Sussex (7.45 pm).

Membership has since risen to well over 30, and the group is to hold an auction on **5 March**. For details, contact **Sonia Guianne, 27 Melrose Avenue, Portslade, East Sussex BN41 2LT. Tel: 01273 887741.**

"You were right - that filter you sold my husband WAS too powerful....."

DIARY DATES

January

Tuesday 3
Gloucestershire AS — Meeting at the Bell & Gavel pub, near the Cattle Market, St. Oswalds Road, Gloucester *for a product review by the committee.* Details: **Stewart Evans,** Tel: 01242 527520.

February

Tuesday 7
Gloucestershire AS — Meeting at the Bell & Gavel pub, near the Cattle Market, St Oswalds Road, Gloucester, *for a marine video from the FBAS library.* Details: **Stewart Evans,** Tel: 01242 527520.

Sunday 19
Yorkshire Cichlid Group — *Spring Auction.* Wrenthorpe St Anne's Church Hall, Wrenthorpe, Wakefield, Yorks. Starts at 1.30 pm. Light refreshments. Lots booked in advance. Details: **Phil Lowe,** Tel: 01302 880512, or **Phil Gardner,** Tel: 01532 600482.

NEXT MONTH

Watch out for two great herpetology features:
A Frog's Life
and
Turtles of Malaysia

The Habu that takes after mother

The Habu (*Trimeresurus flavoviridis*) is a species of Asian Pit Viper. On the Japanese island of Okinawa, members of this species occur in at least three different body colours on their upper (dorsal) surface. The species is therefore said to be **polymorphic** — i.e., there are many different forms.

The most common upper body colour is yellow, but a few snakes are white or even intermediate between these two colours.

In the past, there have been few scientific studies about the frequency of body colour or pattern type within a population of snakes. However, a survey has been undertaken among the 240 hatchlings and 67 full-term embryos derived from the eggs laid by 55 female Habus collected on Okinawa Island — a geographically isolated population — between 1981 and 1992.

Among these 55 females, 49 (89%) were yellow, three (5.5%) were white and three (5.5%) were intermediate in colour. From the eggs laid by these females, no clutch gave rise to only white offspring. Five clutches included both white and yellow young. However, the majority of clutches, a total of 49, gave rise to only yellow hatchlings. (These results account for 54 clutches — a single offspring from the 55th clutch was not easy to classify by colour and was excluded from further consideration).

This large scientific survey confirms the observations of many herpetologists who breed snakes in captivity. The species of Pit Viper studied demonstrates a close association between maternal colour and the colour of their offspring. 47 of the 49 clutches (96%) from yellow mothers gave rise to all-yellow offspring. Two out of the three clutches from intermediate mothers also gave rise to all-yellow offspring. The other five clutches included both yellow hatchlings and white hatchlings in approximately equal numbers in each clutch.

The results in this investigation have been attributed to the fact that the dorsal colour of Habus on Okinawa is determined by a relatively rare **dominant** white gene. When this gene is present it over-rides the effect of the more common but weaker (**recessive**) yellow gene.

JULIAN SIMS

Frogspawn hatched in space results in tadpoles with similarly developed main organs as their terrestrial-based controls.

HERP FACT/Space Spawn

A characteristic of Pond Frogs which belong to the family Ranidae is that the females of most species produce many, many eggs — sometimes hundreds, often thousands — at one spawning. This vast amount of viable biological material is ideal for experimentation because there is enough to test in several different conditions.

Such comparisons can use materials from the same parental origin which has the same genetic components. Inherited differences can therefore be eliminated as the cause of any diversity which occurs during experimentation.

Frogspawn (and tadpoles) have been sent into space to investigate how cell division and tissue development proceed in conditions of zero gravity. The resulting individuals were compared with tadpoles from the same batch of spawn but which remained on earth in North American laboratories where the normal gravitational conditions prevailed.

The main organs formed by tadpoles grown in space were similar to those found in tadpoles which developed on earth during the same period. The tadpoles which remained on Earth acted as the **control** — a reference point against which the space tadpoles that had developed without the effects of gravity could be compared.

Stumpy — a spritely thirty five

Stumpy is a Shingle-back or Stump-tailed Skink (*Trachydosaurus rugosus*) from Southern Australia. These reptiles are some of the most distinctive and abundant lizards which have evolved on the Australian mainland. Stumpy was first acquired by the famous herpetologist and author Kathleen Pickard Smith in 1960 and featured in her classic book *Living with Reptiles* which was published shortly afterwards. At this time, Stumpy was just seven months old.

Now, he is nearly 35 years of

JULIAN SIMS

FRIENDS

By JULIAN SIMS

age and is still thriving. In the picture he is being carefully handled by my son Charles (who is only four years of age). The Natural History Museum in London have also used a Shingle-back as an important visual aid and a living example to demonstrate to children the fascination of reptiles, while allaying any fear or superstition often associated with these animals. The skink at the Natural History Museum was called Oscar.

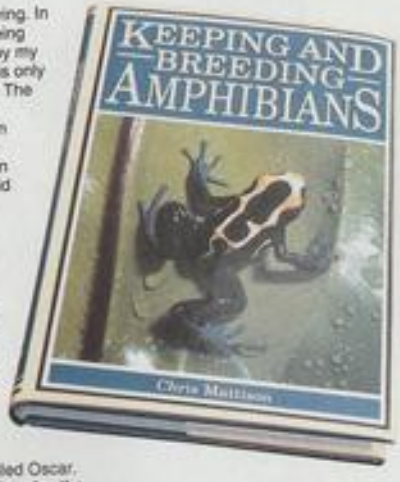
When the **Society for the Study of Amphibians and Reptiles (SSAR)** were compiling their **Herpetological Circular** *Longevity of Reptiles and Amphibians in North American Collections* (2nd Edition), the longest that a Stump-tailed Skink had been maintained in captivity in the USA was 20 years 10 months. This reptile was kept at Topeka Zoo in Kansas.

The previous record cited in the first edition of this circular was for a Shingle-back maintained at Columbus Zoo, Ohio, for 14 years 6 months.

I would welcome news from any readers who also keep Stump-tailed Skinks, and especially details of longevity and captive breeding success. Females are ovo-viviparous, giving birth to one, two or sometimes three relatively large offspring.

Shingle-backs feed on insects, earthworms, meat and fruit, especially banana.

Charles (4 years old) holding Stumpy (35 years old).



Breeding amphibians

A very interesting herpetological book has recently been released by **Blandford** — *Keeping and Breeding Amphibians* by Chris Mattison. ISBN: 0-7137-2328-9.

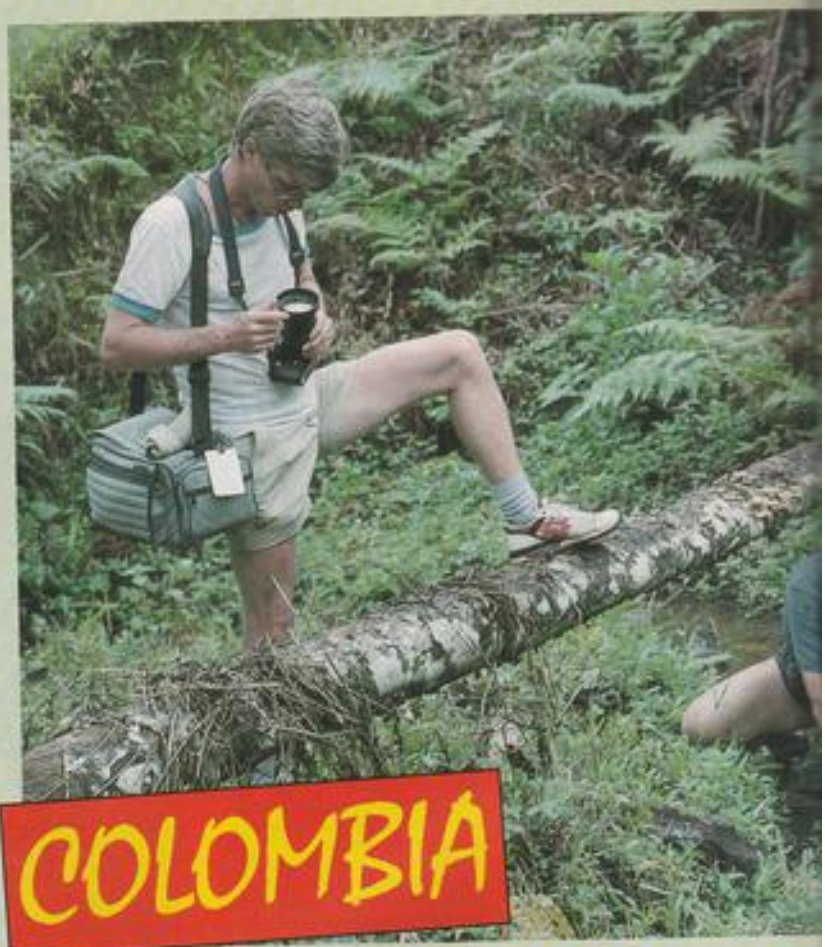
The text is divided into three sections which contain 26 chapters in total. There is also a short guide to specialist societies, journals and magazines, a brief bibliography and comprehensive six-page index.

Part one covers General Principles and contains eight chapters. Topics include: biology, indoor and outdoor vivaria, feeding and reproduction.

Part two is devoted to Caecilians, Newts and Salamanders. The six chapters in this section describe many of the species most commonly seen in captivity.

Part three is, by far, the longest section of the book, occupying almost half of the 222 pages of text. The 12 chapters of this section describe the Frogs and Toads. Details are provided of popular groups including the Painted Frogs (Discoglossidae), Spadefoot Toads (Pelobatidae), True Toads (Bufonidae), Tree Frogs (Hylidae) and the Pond or Water Frogs (Ranidae).

The book is illustrated throughout with excellent colour photographs which admirably support the text. At £15.99, this hardback is good value and will provide a great deal of useful information for herpetologists intending to keep and, more importantly, breed amphibians in captivity.



COLOMBIA

Second-Leg Thrills

PART TWO

Norwegian aquarist and collector **Alf Stalsberg** recalls the successful closing leg of his Colombian adventure.

Photographs by the author

Over our breakfast, we searched our map for places to go to, and since the roads in the region are limited, we decided to follow the one that went south, past the airport.

If we crossed rivers with clear water that looked promising, we would stop and check.

Montañita selection

The first place of interest that we came to was a small village called Montañita. it has a clear-water river going by the name of Quebrada Montañita. We found a nice spot at the riverside, and were quickly in the water.

The Quebrada Montañita was, at the time we were there at the end of February, a shallow, fast-flowing river with some sections of calm water. The bottom was sand, with gravel in the fast-flowing parts. The bottom in the calm-water areas was covered in thick layers of dead leaves.

The water sample readings were: pH 6 (measured with a Tetra test kit) and 7 (measured with an electronic pH meter); dH was 0° — kH was also 0°, and the altitude was 400 masl (metres above sea level) ie. 1,312 ft. The water temperature was 25.9°C (78.6°F) and the air temperature was 32.9°C (91.2°F); the time was just around lunchtime.

Then Tonny called out that he had seen some *Corydoras* catfish. All of a sudden, everybody was looking for *Corydoras*! We did not collect hundreds, but still managed around 15 to 20 altogether. And to tell you the truth, they weren't easy to catch either!

They were swimming about in small groups of around four to six, and preferred to stay close to the riverside, especially under the overhanging branches of the trees. This made them difficult to catch, and gave them good shelter too; the branches of the trees scratched your back, the net was difficult to use under the branches and the current of the water was strong in these shallow parts of the river.

So, under the circumstances, we were very happy with our twenty or so *Corydoras*.

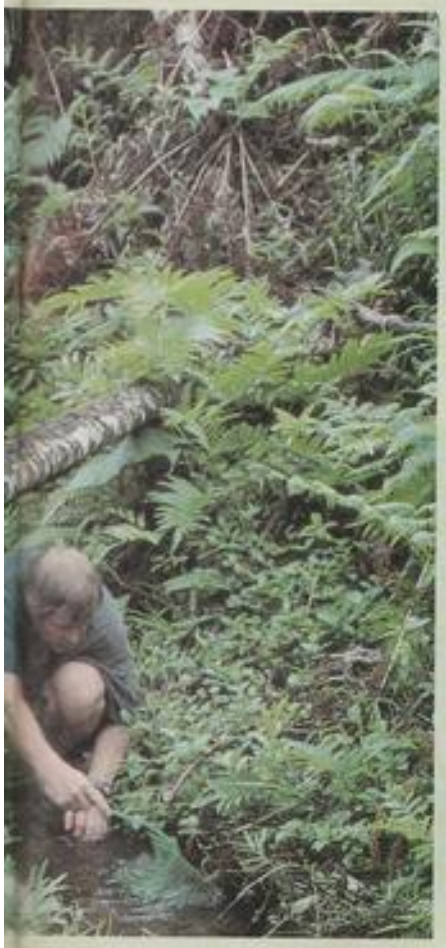
Suddenly, the focus of interest changed. Tonny came up with a fish in his net and asked me to have a look. He had found an *Apistogramma* (dwarf cichlid). Now, everybody wanted to collect *Apistogramma*, but despite hard work for several hours, we came up with only three specimens.

Post-lunch cats

After our lunchbreak I tried to go for my favourites, the mouthbrooding *Acara* which, today, are correctly named *Bujurquina*, but they were not easy to catch either. In the end, I managed to snatch some fry from a brooding female.

There was also several (to us) unknown tetras here, but I concentrated on collecting Loricariids, (Whiptail Catfish) some of them belonging to the genus *Rineloricaria*, *Hypostomus* (Plecos) and two or three different *Spatuloricaria*.

Two of the *Spatuloricaria* were carrying eggs hanging under their bodies. They were quite easy to collect, and when I put the fish with darker eggs into the plastic bag, they started to hatch!



The fish with the other batch of eggs held on to them even when I placed it into the plastic bag. These eggs were yellow and did not start hatching until a week later. However, I was not able to save any of the fry, because of the lack of sufficient food like *Artemia* (brine shrimp).

Time was running out, so we decided to stop collecting, photograph the fish we had caught, and return to Florencia before dark.

Excellent La Granada

Next morning we decided to go much further than Montañita on the road to La Esmeralda and Puerto Rico. We stopped by a river with clear water, but it was cold and fast-flowing, and we could only see large silvery tetras, so we kept on driving in search of the next river.

When we came across it, this river looked good. It was called Quebrada La Granada, and was about 60 kilometres (37 miles) from Florencia. This was a slow-flowing river, with the deepest part (1 metre) under a bridge. The bottom layer was predominantly fine sand, with some gravel in parts.

The Saturday that we were there seemed as if it was the day that people chose for washing their cars for the weekend, so they just drive their cars right into the river and start the washing.

Luckily for us, the car washing was taking place downstream, so we had clear water. Under the bridge, women were washing clothes, while the children swam in the river, so we had curious on-lookers all the time we were there.

The water was excellent, and the river reminded us a lot of Quebrada Muchilero, where we had been on the first day of our trip.

I managed to collect several of my favourites, the *Bujurquina*, and also some *Caquetaia myersi*, but (lucky for me) I went a little higher up the river where the water was too shallow to swim, and caught a bunch of *Bujurquina* fry.

These fry survived the trip back home and are around 10cm (4in) now. We measured the water parameters and the pH was 8 — dH 1° — kH 1° and nitrite was less than 0.1. The altitude was 360 masl (1,180ft). The water temperature was 31.3°C (88.3°F) and the air temperature was 34.1°C (93.4°F).

Return to Muchilero

The next day we were supposed to fly back to Bogotá, but I just had to take a little trip out for the last time, because I was eager to find more killifish. We had only collected one; Kaj had collected it the first day at Quebrada Muchilero.

So I decided that I wanted to go back to

1

3 2

4

1. An egg-laying *Spatuloricaria* from Q. Montañita photographed inside the plastic bag (hence the reflections) we placed it in to ensure that we didn't lose any of the eggs.

2. One of the most interesting fish (in my view) from Q. Montañita was this *Apistogramma* sp "Rotpunkt".

3. *Corydoras* "melini"(?) from Q. Montañita.

4. A tetra... but which one?... from Q. Montañita.

5. Beautiful *Rivulus* sp "taeniatus" from the small stream that drains into Quebrada La Yacu.

COLOMBIA

***BELOW*— This Pleco (*Hypostomus*) was yet another species from Q. Montañita.**

***RIGHT* — *Bujurquina* — my favourite. This is one of the specimens I brought back to Norway and have grown on in my aquarium.**

***BOTTOM RIGHT* — Quebrada Montañita.**

Q. Muchilero to see if I could find more of the *Rivulus* sp. "*taeniata*", a single fish was not much use to bring back. Only two of the others wanted to go on this trip — the other ones wanted to sleep a little longer and start packing for the return to Bogotá in the afternoon.

In the end, we did not find any more of the *Rivulus* out in Q. Muchileros, so, disappointed, we decided to go back.

Final fling

As we started off on our return to Florencia, the driver said he knew about a small river not far away. We had a few hours to spend and nothing to lose, so we decided to have a look.

When we came to the bullring, we turned left off the main road and followed the small road past a school called Santo Domingo and alongside a small river called Quebrada La Yacu. The small road eventually became a dust road (and not a very good one) and then, suddenly, the track came to an end. As we turned round, I saw a small stream on the other side of a barbed wire fence.

Our hopes were not very high, but suddenly, I thought I saw something and called the others. I dipped my net in a very, very shallow part of the stream with nearly no water, only algae. When I lifted it up, something was moving... and there they were, killifish!

Was I happy! Here, as last, were the killies... at the very last minute too.

We followed the stream up and were able to collect several more killifish. I think we managed around twenty fishes by the time we had to stop.

I then decided to check a small pond in the stream and put my handnet under the overhanging plants. All of sudden, something dashed out. I jumped out of the water and my heart nearly stopped. I thought it was a snake, but when I looked down into the water, I could see a dark shadow by a rock.

I took the net slowly and carefully down into the water, and then pulled it up fast, with whatever 'it' was in it. It turned out to be a large cichlid of, at least, 25cm (10in) length.

We put it into a large plastic bag to study it more carefully, and came to the conclusion that this looked very much like *"Cichlasoma" umbriferum*, the Blue-speckled Cichlid.

Sven O. Kullander later confirmed that it was, indeed *"C". umbriferum*, and that the fish had probably been put out where we found it, or had escaped from a fish farm raising food fish.

Soon we were back at the hotel, packing for our return to Bogotá. I know one thing for sure: I'm going back to Florencia! AAP