

MARCH 1994

A & P

AQUARIST & PONDKEEPER

UK: £1.75
US: \$4.95

**BREEDING
THE PLUMED
BASILISK**



MARINES SPECIAL



**THE MORECAMBE
BAY REEF**



**SQUIRRELS
AND SOLDIERS**



**SEA
CUCUMBERS**

**A RIVER
REBORN IN
SAUDI ARABIA**

**NEW
SERIES
FOR FANS OF
DISCUS**



**THE DEADLY
PREDATOR**

SEE SPOTLIGHT

**VALUE
FOR MONEY
DANIOS**

**PROFILE ON
THE FORK
TAILED
CATFISH**

**PLUS
ALL YOUR
REGULARS**

**GOLDFISH-
A FISH FOR
ALL SEASONS**



**POND
SPRING
TIPS**





See page 80

Contents

MARCH 1994 VOL. 58 NO. 12



See page 44

Features

Spring into Action with **John Dawes** as he provides some of his top pond tips of the season **4**

Value-for-money Danios. As **Linda Lewis** shows, they are hard to beat **8**

Meanwhile, Back at the Lab, **David Basckin** is having Koi parasite problems **13**

Reef Hunting in Morecambe Bay. A&P cartoonist **John Anderson** tracks down a more-than-enthusiastic marine hobbyist **18**

Sea Cucumber Secrets. All is revealed ... plus a little more ... by **Dr Lin Baldock** **22**



See page 8

A Fish for all Seasons. **Alex Stephenson** passes on some expert tips on choosing Goldfish **28**

Showtime! **Derek Lambert's** invaluable guide to exhibiting show-winning fish **34**

Spotlight on the turbulent world of the ever-popular **Convict Cichlid**, courtesy of **Mary Bailey** **44**

Saudi Arabia. **William Ross** on the fascinating story of

a **River Reborn** **50**

Keeping and Breeding the Plumed Basilisk. A special treat for lizard fans from **Robert and Valerie Davies** **63**

Keeping the Fork-tailed Catfish. An introduction to this rarely seen, but highly desirable, fish from **Andy Stratton** **76**

Squirrels and Soldiers of the Coral Reef: **Frank de Graaf** presents a spec-

Regulars

tacular word/picture portrait of these beautiful twilight fishes **80**

Editorial:
Selfish Beauty 3
Write Back 7
News 12
Fascinating Fish

Facts 12 & 60
Koi Calendar 16

NEW SERIES:

Discussion 21

Helping Hand 25

Books 26

Coldwater Jottings 32

Question Time 37

Koi Talk 48

Frogs and Friends 54

Tomorrow's Aquarist 56

Seaview 58

What's Your Opinion 61

Water's Edge 75

Trade Talk 78

Society World 79

EDITOR John Dawes. **ART EDITOR** Ian Hunt. **ADVERTISEMENT MANAGER** John Young. **ADVERTISEMENT PRODUCTION** Gwen McNeil. **PUBLISHED BY** Dog World Publications, 9 Tufon Street, Ashford, Kent TN23 1QN. **TELEPHONE: ADVERTISING AND PRODUCTION/CLASSIFIEDS & BUYERS GUIDE** 0233 621877. **FAX NUMBER** 0233 645669. **SUBSCRIPTIONS** £21 per annum post paid. Overseas rates on application. All subscriptions payable in advance to: Aquarist & Pondkeeper, 9 Tufon Street, Ashford, Kent TN23 1QN. Origination by Wishpark Ltd/Ashford Composition Ltd. Printed by Headley Brothers Ltd, The Invicta Press, all of Ashford, Kent.

Distributed to the Newstrade by: Seymour International, Press Distributors Ltd, Windor House, 1270 London Road, Norbury, London, SW16 4DH.

Editorial

SELFISH BEAUTY

Some years ago, I photographed a shoal of Yellow-tailed Barracuda in the Red Sea — through the windows of the underwater observatory, I hasten to add!

What stimulated me to take those shots was the fact that several of the Barracudas were carrying horrific gashes, indicating that these classic predators were, in their turn, the prey of other larger, even-more-voracious, hunters.

We often refer to fish such as Barracuda and Piranha as being 'perfectly adapted' for their roles as top predators. So, how come our seas and rivers are not over-run with these species to the exclusion of all others? Quite simply — among other reasons — because prey animals, such as Neons, Cardinals, Whitebait, Smelts ... and so on, are equally well adapted for avoiding capture.

This finely tuned dynamic equilibrium between hunter and hunted (remember that lions, too, are hunters in their own way) results in an amazing array of colours, bodies and behaviours that we, as fish lovers, go crazy over. I am referring here to wild-type forms only, of course.

Yet, the beauty we observe in Gobies and Guppies, Surgeons and Swordtails,

is merely the result of the genes they carry. What we see are external manifestations of internal genetic commands.

Our fish ... and us, for that matter ... are — at least according to one school of thought — carriers of 'selfish' genes, whether we like it or not. Our ability to survive

from one generation to another is therefore little more than a reflection on how well our genes ... or our fishes' genes ... are capable of tackling this daunting biological challenge.

A humbling thought, isn't it?

John Dawes



Spring

into Action



The Marsh Marigold — one of the earliest spring 'risers'.



Feed fish very sparingly during early spring, using one of the lighter food formulations



Eliminating green water requires patience

As we enter March, our ponds are just beginning to wake up from their winter slumber. Then, as the month progresses, we begin to move towards early spring, traditionally regarded by pondkeepers as the start of the outdoor season.

In reality, early spring is a time of little visible activity in the pond. Fish are rather sluggish and plant growth limited at best, except for one or two species like the Marsh Marigold, *Caltha palustris*. This splendid plant, with its brilliant canary-yellow blooms, spectacularly gives us one of the first indications that better times lie

A&P editor John Dawes offers ten tips designed to get the pondkeeping season off to a flying start.

Photographs — unless otherwise indicated — by the author

ahead, despite the snow, ice and severe frosts that can still bite hard with little or no warning.

Much of the success — or failure — that we are likely to experience in the months that follow, depend, to a considerable extent, on what preparatory work we put in the previous autumn to get our ponds, plants and fish ready for the winter that is just beginning to pass. A lot will also depend on the preparations that we carry out during the spring.

Dive in without forethought, feeding your fish three times a day on protein-rich pellets, and you'll be asking for trouble. ▶

Below: Filamentous algae are collectively known as Blanket Weed



Right: Spring visitors to the pond will include mating frogs



Delay getting those, by-now, rotted leaves out of the pond, and you could equally be laying down the foundations for a miserable season.

Spring Tips

There are quite a few things that we can do to enhance our chances of success. Here, for example, are ten tips worth considering:

1 Feed fish very sparingly at first, and only when they show signs of active searching. Do bear in mind that temperatures can, and will, plummet during early spring. If and when they do, the last thing a fish needs is a gutful of high-protein food which it will have trouble in digesting.

Therefore, use a lighter wheatgerm-based pellet or stick to start off with, and feed late morning or early afternoon. Avoid feeding late in the day as it will be then that the temperature will begin to drop.

2 A partial water change may be carried out during the middle of March, either by siphoning out some pondwater and replacing it gradually with tapwater, or by running a trickle of water into the pond and allowing it to overflow for a number of hours. Either way, the use of a proprietary dechlorinator and water conditioner is advisable. If you have not yet removed dead leaves which may have accumulated during autumn and winter, do so now.

3 Mid-spring is characterised by a higher level of activity among the fish and plants. Fish can now be fed regularly (but in small amounts at first) and the protein level of the food can be gradually increased.

4 Pondwater may turn green, but do resist the temptation to carry out a further major water change. This will only introduce a new supply of mineral salts which the algae will feed on to reproduce

to epidemic levels in a very short time. It is preferable to wait and allow natural growth of submerged and surface plants to absorb nutrients from the water and shade it sufficiently to discourage algal growth.



As spring gets under way, so does spawning.

Algicide tablets, slow-release blocks, powder and liquid treatments are all available and can be used to produce quick, though sometimes temporary, results. Some of the new-generation algicides have in-built plant growth promoting 'water-balancing' ingredients and these are certainly well worth considering.

5 In recent years, the use of straw, particularly barley, has been used with considerable effect against algal infestation. This long/slow-acting method has maximum effect when the straw (used at the rate of about 100gm/cu. metre 35oz/220 Imp. gal) is placed in the way of a circulating waterflow, as that which operates in 'chambered' filter systems. As the straw begins to break down, it appears to release some chemicals which kill off algae but have no harmful effects on fish and other types of pondlife.

6 Filamentous algae, which form dense clumps and are collectively referred to as Blanket Weed, can present problems during spring, or in stagnant water at any other time. Removal by hand, or by rotat-

ing a cleft stick in each clump, is an essential first step. The avoidance of still, standing water, especially in shallow areas, plus adequate growth of normal plants, will subsequently help keep Blanket Weed under control.

7 Spawning will begin in spring and stretch into summer. Bunches of fine leaved vegetation or spawning mats containing Koi or Goldfish eggs can be removed to a second pond or an aquarium where hatching can take place in relative safety. Alternatively, the spawn may be left in the pond, where eggs and fry will have to take their chances, just as they do in the wild.

8 As from early spring, amphibians will begin arriving. The frogs will come first, followed by the toads and newts.

Whether you welcome such creatures or not is a matter of opinion. Personally, I love them. True, some slow-moving fancy varieties of Goldfish could be grabbed by an over-ambitious male frog or toad, but — on those rare occasions when this happens — the clasp is generally short-lived. In my many years of pondkeeping, none of my fish have ever experienced this sort of problem, but then, the fanciest Goldfish I've ever kept in my ponds have been slim-bodied 'mobile' quasi-Fantails.

9 Late spring is a good time for planting, or for a general clean-out of an established pond. It must be remembered, though, that a re-filled overhauled pond is, in effect, a new pond, and will require time to mature and settle down.

10 By late spring, the fish will be feeding well and should receive several feeds per day.

Successful pondkeeping is largely based on commonsense and preventive, rather than remedial, measures, and spring presents us with some of the best opportunities to apply these. It will therefore pay to take advantage of these opportunities which, incidentally, also have a tremendously uplifting effect on our conscience. Happy pondkeeping!

WRITEBACK

BIOPLAST LETTER OF THE MONTH

Cyanide, reef farming and captive breeding

After reading *Cyanide-free San Salvador* by Marie-Paule and Christian Piednoir in the December issue of *Aquarist & Pondkeeper*, I felt the disquiet that often accompanies thoughts about the morality of my hobby. For example, is it reasonable that 'small' lives should be sacrificed so that I can gaze upon the wonders of the reef from the comfort of my armchair? I offer the following thoughts in defence of this fascinating pastime.

All too often, well intentioned people propose legislation that restricts or stops the movement, export, import, collecting or keeping of wildlife. These restrictions seldom prove successful, either driving trade underground or, by removing the commercial value from a species, causing its destruction as a pest. I would cite the Australian wildlife laws on native birds, or the use of European tortoises for 'hardcore' now that their export is banned, as disturbing examples of this. What we need is habitat conservation and education, seasoned with a little commercial exploitation.

Habitat conservation has to be of prime importance, wherever or whenever one is trying to preserve a species. If an animal has no place to live, and no place to feed, or the local climatic conditions change, then it has no chance of surviving.

Education is the secret to most

ecological problems. If we teach the collectors to fish safely — as the above-mentioned article explains — to conserve the fish stocks as a crop and to consider the medium and long-term needs of their community, we must progress.

For our part, the 'Affluent West', (or should that be the 'Effluent West?'), we need to research more and more into the captive breeding of both fish and invertebrates.

Many of the reef fishes would seem to be shoot apneans, with the eggs and fry forming part of the plankton layer, but not all are. Do we, for instance, still need to collect Common or Tomato Clowns from the wild? Pay more and promote captive breeding programmes!

Commercial exploitation offers the brightest prospect for future reef conservation. If a thing has sufficient value, it will be cherished and, as fishes become more difficult to collect, we may see business striving to manage the remaining sites more effectively.

But why wait? Would it not be wise for the major European importers to invest in reef farming while there are still reefs to farm? It would seem unreasonable to expect some poor, under-equipped fisherman to show restraint, when his day-to-day survival depends upon collecting whatever he can.

On a brighter note, things have



improved. In the 35 years that I have been trying to keep marines (not always successfully), we have taken great strides forward. The chemistry of marine fish-keeping is now better understood than it was. Modern equipment makes maintaining marine fish almost easy, and the cures, foods, advice and information that are now available are almost unlimited.

The fish are now cheaper and in better condition when they arrive in this country, and it's up to us to patronise shops that maintain them in this condition. The shops I buy from are members of OFI (UK) and try to offer healthy stock, good advice and friendly service. It's a long time since I have been able to blame cyanide poisoning for the death of a fish!

So the tide is turning and there are good cyanide-free stocks widely available today. I have no doubt that Marie-Paule and Christian Piednoir's article will help matters even further.

David Kershaw,
Secretary, West Yorkshire
Marine Aquarist Group.

Thank you David, for sharing your thoughts. You will shortly be receiving a package containing £30 worth of BioPlast products for you to use as you best see fit within WYMAGI.

Ed

Reindeer changes

How nice it was to read about someone else's happy experience with a wrasse: the 'Reindeer Wrasse' (ASP, January '94).

I, too, have had happy experiences with this wonderful, proud and cheeky fish. I have kept Cleaners, Silver Bellies, Clowns and more, but my favourite of all time has to be another wrasse, the Spotfin Clown Wrasse (*Coris formosa*), not to be mistaken with the African Clown Wrasse (*Coris gaimard africana*) which has no black spot on its back when a juvenile.

What surprised me about the article was how the writer omitted the most important fact about the wrasse: its colour change when becoming an adult. The mottled pattern of the juvenile Reindeer Wrasse gives way to an overall grey body colour with a lighter head and whitish and black bars in the tail.

However, I have not yet experienced the change! Does it happen slowly? Why does it happen? At what age?

I have found wrasses to be generally peaceful fish, requiring only a bed of sand or similar, and the scraps left behind by my Clowns, Damselfish, Hawks and Puffers.

Let's have more articles on Wrasse please!

Clare Angel,
Enfield,
Middlesex.

[Watch out for a great article on British Wrasse from Andy Horton in the next couple of months. Ed]



Fish & Pond Chips

They are made for each other

Pond Chips a complete food specifically developed for Koi and all outdoor fish

"The perfect combination for those who just want to do it better"

King British Fish foods & Water treatments
On sale at Garden centres, Aquatic shops and Pet shops



KEEPING *and Breeding:* Value-for-

Danios were among the first tropical fish I ever purchased. Then, as a beginner, I wanted to ensure that I chose hardy, easy-to-keep fish until I felt I knew what I was doing. I had a 24in (10-gallon) tank which was eventually stocked with Zebra Danios, a shoal of Neons and two Corydoras catfish.

Danios are active fish. Unfortunately, as mine grew to adulthood, their habits became less 'community-friendly'. Not content with constantly chasing each other, they began to harass the other occupants, trying to nip fins and giving the Neons no peace.

I decided that the situation could not be allowed to continue. The Danios were therefore captured and transferred to a tank at the office where I worked. This tank was much larger (48 x 18 x 18in — 120 x 45 x 45cm) and was home to Tiger Barbs and other less easily upset fish who would not be distressed by the hyperactive Danios.

I need not have worried, for as soon as they arrived in the bigger tank, their behaviour changed and they were once more content to chase only their own kind. Consequently, in later years, when I moved on to larger aquariums, I decided to give Danios another try.

Three top Danios

The most commonly available species is the Zebra (*Brachydanio rerio*) so-called because of its striking pattern of stripes. These run horizontally, however, and not vertically as in the four-legged zebra. The stripes are dark blue on either a silver (female) or goldish (male) background. The markings continue into the anal and caudal fins, while the remaining fins are virtually colourless. Adults grow to about

45mm (1.8in) excluding tail.

Another type which is also common is the Leopard Danio (*Brachydanio frankei*). For an eye-opening report on these fish see **Striped Secrets of the Leopard Danio** by Dr. George Cust in the August '93 issue of *A&P*. These attractive fish are covered with leopard-like markings on either a gold or silver background.

Even lovelier perhaps, are Pearl Danios (*Brachydanio albolineatus*) which shimmer like mother-of-pearl with delicate shades of blue and pink that sparkle in sunlight.

All three types share one feature — a small pair of barbels. These are so fine as to look like hairs drooping down around the mouth.

Fast feeders

Danios resemble torpedoes, with their streamlined shape, ideal for racing through fast-moving waters. Originally, they hail from the fast-flowing streams of Sumatra, Burma and parts of India. They are constantly on the move and are extremely agile in the water.

The dorsal fin is set well back along the body and this, along with the upward placed mouth, indicates that they are primarily designed for surface feeding. They do take food at the surface but, in practice, they will take food from any level and are the least fussy eaters I know. Danios

Linda Lewis offers her personal tips for success with these lightning-fast beautiful shoalers.



BILL TOMKEY

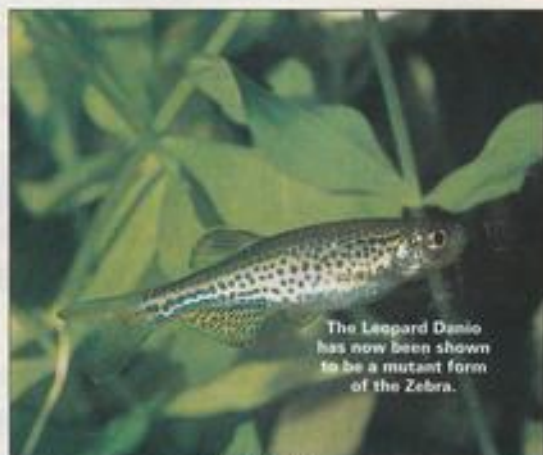


HARRY GREK, FLORIDA TROPICAL FISH FARMERS ASSOCIATION



The most popular of all Danios is the Zebra.

LINDA LEWIS



The Leopard Danio has now been shown to be a mutant form of the Zebra.

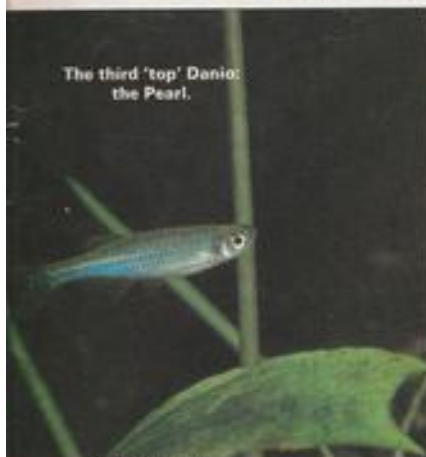
MIKE SANDFORD

-money Danios

A rarely seen Danio with no common name, but related to the Giant Danio: *Danio pathirana*.



One of the better known artificial varieties: the long-finned Leopard Danio.



The third 'top' Danio: the Pearl.

MIKE SANDFORD



The latest Danio to make an appearance is this Golden Giant Danio produced by S-D Tropicals of Florida.

will greedily consume flake and dried food, pellets meant for bottom feeders, live and frozen or dried food.

Some fish are delicate in their eating habits. Neons, for example, will take a good few seconds to eat a single bloodworm. By contrast, Danios eat fast and furiously, and never seem to know when to stop. They eat until they begin to bulge, and still they look for more. If they have finished any floating food, they will muscle in on the catfish and their pellets.

Easy breeders

If feeding Danios is easy, breeding them is simple too. When the fish are immature, it is hard to tell male from female. Fortunately, this changes as the fish grow. Females become noticeably plump when carrying eggs and, to make telling the sexes apart even easier, the colours of the males in both Zebras and Leopards intensify when they are in breeding condition. They take on the most beautiful golden hue, reminiscent of honey, and seem to glow in the light.

This transformation happens overnight. One day all the Zebras and Leopards are deep blue on silver; the next, it looks as

though a different species has arrived, wearing coats of gold as the males prepare to spawn. In this condition, Leopard Danios bear an even closer resemblance to their feline namesake.

Getting the fish to spawn is not a problem. They seem happy to spawn in any conditions — from a separate breeding tank, to a community aquarium, in temperatures from 70-90°F (21-32°C), and in a range of pH from 6.5-7.5, morning, afternoon or evening. My shoal lives in a 36 x 12 x 12in (90 x 30 x 30cm) tank which is kept at a temperature of 72°F (22°C) and at a pH of around 6.7 which suits the Neons and Black Widow Tetras that, along with Black-spotted and Peppered Corys, make up the rest of the community.

Shoal spawners

Danios are egg scatterers. In other words, the female just drops her eggs as she swims and the male fertilises them, also while on the move. Spawning is frequent and lively affairs.

At the moment, I have a shoal of sixteen Danios, a mixture of Zebras and Leopards. Usually, between four and six fish are involved in each spawning chase. This small group comprises a plump female and a retinue of males. Fertilisation is indiscriminate and any male stands a chance, as long as he can keep up!

Once the female has finished dropping her eggs, the males will switch their attention to another female if one is ready to spawn. The chase is not a straightforward race. Instead, the bunch of fish wriggle and writhe like eels, continually changing direction and backtracking. Eggs may be dropped near the surface or on the gravel. Spawning Danios are oblivious to other fish at this time and will swarm over any Corydoras that might be slow to get out of the way.

Safety measures

Many eggs are eaten as soon as they are laid. Those that do fall safely to the gravel will soon be found by either the parents or catfish. Therefore, if fry are to be raised, special arrangements are necessary.

A plump female should be selected, along with at least two fit and active males. They can then be removed to another tank (size does not matter, as long as the fish have room to chase) ensuring that water conditions are exactly the same ▶

◀ as those that the fish have just left.

I don't use nets; not so much because it can stress the fish, but rather, that it stresses me! Fortunately, catching Danios without a net couldn't be simpler. They are naturally inquisitive and never seem to learn to avoid strange objects in the tank.

My favourite method of catching them is to dip a transparent beaker in the water. Immediately, one or more fish will begin to investigate and swim inside. With just a little patience, the chosen fish will soon oblige by swimming into the trap, whence they can be lifted out and transferred to the breeding tank with no problems or stress. This method also means that you don't risk upsetting the other occupants of the aquarium with a mad net chase.

Once your chosen fish are in the tank, some thought needs to be given to the eggs and ways of ensuring that some survive. Many methods are possible. A layer of marbles could be placed in the tank so that the eggs fall between them and are safe. Some kind of divider, or netting, can also be used so that the eggs can fall through but the adults cannot follow.

Alternatively, you can do nothing. It has been my experience that some eggs always survive and, unless you want hundreds of baby Danios, no special methods need be used. On the last occasion, I managed to raise fifty babies in this way. The only thing I had to do was to remove the adults from the breeding tank as soon as possible once spawning had finished,

Some other Danios		
COMMON NAME	SCIENTIFIC NAME	SIZE
Blue or Kerr's Danio	<i>Brachydanio keri</i>	2in-5cm
Spotted Danio	<i>B. nigrofasciatus</i>	2in-5cm
Giant Danio	<i>Danio aequipinnatus</i>	4in-10cm
Bengal Danio	<i>D. devario</i>	6in-15cm

giving the fish little time to find and feed on the eggs.

Eggs hatch in one or two days, according to species and water temperature, and the fry are free-swimming a few days later so, if there is no sign of life after a week, you know that you should try again.

Problem-free rearing

Raising the fry is not a problem, as they will feed happily on anything that can fit into their mouths. Even a diet of ordinary crumbled flake food will do. I supplement this with newly-hatched brine shrimp, simply because this food is easy to provide.

The young fish are miniature versions of the adults, complete with markings, almost from day one.

Longlived adults

One thing about Danios that surprised me is their longevity. They are among the cheapest tropical fish you can buy and, because of this, I had originally expected them to live only a year or so, possibly two. Yet, some of my fish are now four years old and still going strong. As they

get older however, their age begins to show.

Firstly, the older the fish, the bigger it becomes. I have read that fish continue to grow throughout life and this does seem to be the case, although the rate of growth slows down with time.

Secondly, at about the age of two, the fish start to become humpbacked, until the condition is quite marked. Young specimens have flat backs, suited to a life at the surface.

As they get older still, they become less resistant to disease and may develop minor swim bladder problems and eye infections. My oldest female is now blind in one eye and terribly humped, yet she is still spawning and leading attentive groups of males in regular chases.

Danios are a useful addition to many tanks, the main proviso being that they need room to swim. I would suggest a minimum of 30 x 15in (45 x 38cm) or 36 x 12in (60 x 30cm); tank depth is less important. They don't eat plants, so these fish can be added with safety to a planted tank. In fact, plants add to the fun of keeping Danios, as the fish love to chase in and out of leaves and stems.

The fact that Danios are always on the move means that an aquarium containing them will never look dull. Then, of course, as they are so reasonably priced, this also means that a good sized shoal is not expensive and will provide entertainment for years, given a little care and attention.

MAP

Pay a visit to WHOLESALE TROPICALS (RETAIL ONLY)

Large selection of Tropical Fish always in stock
Plants and Equipment

Many of our customers say we have one of the best selections of tropical fish in London, and probably the country. With over 20 years experience supplying the aquatic trade.

**WE STOCK FULL RANGE
OF EHEIM PRODUCTS
PRICES ON REQUEST**

150 Tanks of tropical fish which normally include 20 species of *Synodontis*, 30 species of *Corydoras*, 25 species of killifish, Blue Brown Tefe — Turquoise — Heckel discus. Clown — Blue-eye, a good selection of *Cichlasoma* Apistogramma, and many others. Also *Corydoras Panda* and *Brochis Britskii*.

A selection of aquatic grown *Cryptocorynes*

● SPECIAL OFFER — CASH ONLY AT THESE PRICES ●

Tank, F/top cover, heater, thermostat, internal power filter, GroLux lighting, thermometer, gravel.

24" x 15" x 12" £60.50 — 36" x 15" x 12" £81.20 — 48" x 15" x 12" £97.10 k/down tubular steel stand 24" £25.20 — 36" £26.50 — 48" £32.00

All-glass aquariums 24" x 15" x 12" £12.50 — 36" 15" 12" £16.50 — 48" x 15" 12" £21.00

Any size of All-glass aquariums made to order at competitive prices

If you are in the area please pay us a visit Ask for Terry — Club visits welcome
Open: Mon, Tues, Wed, Fri, 10am-6pm. Thurs, 10am-2pm. Sat 9am-6pm. Sun 9am-1.30pm.

**10% DISCOUNT WITH A CUTTING
OF THIS ADVERTISEMENT,
APART FROM SPECIAL OFFERS**

On No 8 Bus Route — Opposite main Post Office
220 BETHNAL GREEN ROAD, LONDON E2 Tel: 071-739-5356 Fax: 071-729-2444

PRICES CORRECT AT TIME OF GOING TO PRESS

PDSA & RSPCA seek Marathon sponsors

The People's Dispensary for Sick Animals (PDSA) and the Royal Society for the Prevention of Cruelty to Animals (RSPCA) are seeking sponsors for their runners in the London Marathon (17 April).

The PDSA provides for veterinary care and cannot charge for treatment nor provide vaccinations for (or perform cosmetic surgery on) fish. The RSPCA can do all of these and provides around 200,000 treatments per annum.

The PDSA is the largest employer of veterinary surgeons in the UK and, with a budget of £18m per year, spends approximately 77% on veterinary services. In comparison, the annual budget of the RSPCA is around £31m, and 15% is spent on veterinary care.

Sponsorship money can be donated directly at a local branch of either the PDSA or the RSPCA, or sent to the appropriate headquarters: PDSA, Whitechapel Way, Prioralee TF2 9PQ; RSPCA, Causeway, Horsham RH12 1HG.

An information booklet entitled *Keeping an Aquarium* is available

by sending a stamped and addressed envelope to the PDSA Leaflet Section. The leaflet includes a basic introduction to coldwater aquaria, plants, choosing fish, getting the fish home, feeding, breeding from livebearers and egg-layers, tropical aquaria, White Spot and Fin Rot.

The RSPCA is a major partner in the Brussels-based Eurogroup for Animal Welfare and can advise on forthcoming changes in European Union legislation. According to the organisation, its trans-national network can provide information from afar. For example, if you were buying fish from Japan, the Tokyo branch of the RSPCA could inform you about prevalent diseases.

Keeper exchange boosts experience

A series of exchanges has helped to boost awareness of conservation and increase experience for aquarists at Rhyl Sea-



CHESTER ZOO

Mike Crumpler, left, aquarist at Chester Zoo, with Emma Haddock and Dave Hellewell, of Blackpool Sealife Centre with the four newly hatched Dogfish.

life Centre and Blackpool Sealife Centre, and for keepers at Chester Zoo.

The zoo's aquarists Mike Crumpler and Justin Bell have both spent some time working in the Sealife Centres; while Blackpool Sealife Centre's keeper Dave Hellewell and education officer Emma Haddock have been working at Chester zoo.

The Sealife couple were partic-

ularly interested in the zoo's conservation breeding programmes for rare and endangered fish; while, at Rhyl Sealife Centre, the Chester Zoo team was given four Dogfish egg cases (known as Mermaid's Purses) and two Thornback Ray egg cases. These were hatched in the zoo's aquaria and the fish have been passed on to Blackpool for release into the sea.

FASCINATING FISH FACTS

Fast-moving posterior

The Pirate Perch (*Aphredoderus sayanus*) is a small (6-inch) fish which seems to lack any spectacular feature that would make it stand out in a crowd ... were it not for its highly mobile anus!

When it hatches, a young Pirate Perch has its vent just where every other respectable fish has it, that is, just in front of the anal (belly) fin. However, as it begins to grow, something rather odd begins to happen — the anus begins to move forward!

Over a period of months — the actual duration varies, depending on food availability, temperature and other factors — the aperture moves up towards the front end, passing between the paired pelvic (hip) fins and eventually ending up under the throat.

This doesn't seem to bother Pirate Perches in the least, of course. However, it won't come as a surprise to learn that this weird situation is not known in any other fish!



The deceptively normal-looking Pirate Perch.

MEANWHILE



Back to the Lab...

There was no doubt about it. The Koi were itchy, very itchy, as they rolled and rubbed themselves against the substrate of the pond. Sprinkling a few floating food sticks on the surface, I carefully examined each fish as it lazied up to the surface, mouth agape for the little bit of delicious German delicatessen.

On the Matsuba, I counted three fish lice, scuttling across the tail and dorsal fins. The Harewake had one, while the Shusui, a sort of no-name brand 'Crypto-Koi' that my daughter fell in love with at a school fête, had a gruesome anchor worm latched onto its left side. Most of the others showed much the same assortment of ectoparasites, a shocking sight that filled my Koi-loving heart with a deep and powerful revulsion.

Dashing off to the petshop, I bought a patent British anti-parasite medicine that

South African Koi keeper David Basckin wages all-out war on fish lice and anchor worms ... with a little help from A&P and his local vet.

the dealer guaranteed would rid of ectoparasites the fish, the plants, the pond and damn-near everything else in the immediate vicinity! Thank God it's British, I thought, clutching the little plastic phial to my heart.

Down here at the very bottom of Africa, where the next nearest continent is

Antarctica, we simple Third Worlders have a profound and heartening trust in the products of England. There's something about the Union Jack that fills one with confidence.

The instructions were quite simple, despite the curious lack of metric equivalents. Converting gallons into litres and capfuls into millilitres took but a few moments, as I mixed the green liquid with pondwater, stirred it carefully, and sprinkled it across the surface of the pond. It seemed to have something of an immediate effect, as a solitary fish louse detached itself from a host, and swam freely through the water.

Grabbing a net, I hoicked it out and let it settle into a life of confinement within a 100ml Erlenmeyer flask filled with medicated pondwater. Happy, it would seem, it swam about, slowly getting greener.

'Pond Medication Days' 3, 6, 8 and 10

came and went. On-day 11, the Matsuba, the Hariwake and the Shusui swam up to the surface for some floating pond sticks. This time the Hariwake had three lice, the Shusui one and the Matsuba had become home to a small gang of anchor worms. They looked like hell.

Meanwhile, back in the Erlenmeyer flask, the captive fish louse was doing fine, just fine; a little thinner maybe, due to its thoughtless captor failing to provide a prize Shiro Utsuri or maybe a Showa for it to snack on.

A&P to the rescue

There was nothing left to do. Grabbing at the bound back copies of *Aquarist & Pondkeeper* that make our studio a shrine to fellow fish fanatics the length and breadth of the city, I frantically rifled through them until I came to August 1990, with its **Koi Supplement: Questions and Answers**.

And there it was, up at the top of page 44: for microparasites, the recommended veterinary cure was Leteux Meyer mixture, a gloriously metric formula made up of 3.3g Malachite Green in 1 litre formalin to make up the stock solution. Relief was at hand. Rushing back to the lab, I snatched a bottle of Malachitgrün-Oxalat off the shelf, and decanted a litre of formalin from the store. But wait. Shall't you formalin be 30% or 40% concentration? Page 44, for all its brisk, British, business-

like commonsense, failed to specify.

I phoned the vet, something I should have done right at the start. Fortunately, he's a Koi enthusiast also, and needless to say, knew exactly what to do. "Just take a heaped teaspoon of Malachite," he said, "And mix it with 750ml of 40% formalin. This will do a 30,000 litre pool."

I thanked him, and rang off. So now we knew the exact specifications of the formalin, but what had happened to the Malachite Green? Page 44's precise 3.3g had suddenly become a vague heaped teaspoon.

For some reason, the water was off at the lab, so I relocated the do-it-yourself veterinary pharmaceutical production line to the kitchen.

DIY Pharmaceuticals

I dusted off the triple beam balance, and carefully avoiding too close a relationship with the Malachite Green powder (carcinogenic, according to *Aquarist & Pondkeeper*), I weighed three heaped teaspoons separately, and took the average. It came to exactly three grams. Since I intended mixing only 250ml of the working solution, I weighed one gram of the green stuff, and put the rest back in the bottle. A few grains of Malachite Green split on the white kitchen counter, but, no matter, it was a wipe-clean surface.

Wetting a cloth, I wiped. From now-here, there came a giant green smudge,

the size of a banana leaf. I added more water, and the smudge spread, dripping, across the entire counter and onto the beige, ceramic-tiled floor. Greedily, the tiles drank up the green flood like a sponge.

Panicking now, I set to hosing down the entire area with laundry bleach, followed by a powerful chemical I usually use to degrease old Land Rover engines. The combination, probably as carcinogenic as the original spill, seemed to work, dulling the bright green stains to something that might just have followed on a standard kitchen accident.

Success at last!

Calculating the ratio of home-made ectoparasite repellent to pond-water, I poured off the 6.2ml required, mixed it with pond water, and sprinkled it slowly across the surface of the pond. Waiting for it to disperse, I then drew a 100ml sample from the now-medicated pond, and manipulated my captive fish louse into the solution. He or she fell like a poleaxed ox, utterly, totally, irrevocably dead. What do you know, the spell worked!

More to the point, following the statutory redosing regime, the bloodsuckers in my Koi pond have disappeared, leaving my Matsubas, Hariwakes and even the Shusui in the best of health, as they grow bigger and bigger in the bright Southern African sun.

Open every day of the year



The Living World Ltd
206 Arwley Road, Leeds LS12 2LY
Tel: Leeds (0532) 631509

Now with over 400 aquariums in our ultramodern fish department, magnificent 20 feet long indoor reef aquarium, 60 marine fish and invertebrate aquariums, 27 plant display pools.

Our aquarium department is simply Number One!

Our stock of fish tanks and equipment is unrivalled with over 100 sizes of fish tanks and cabinets from all leading manufacturers, i.e. Minireef, Hockney, Jewel, Mariner, John Allen plus our own extensive economy range in stock ready to take home.

Our new extended Dry Goods department has the finest available selection of equipment in the U.K. Over 8,000 sq ft filled with every possible make of aquarium and equipment.

Following re-development we are now the UK's No 1 Pet and Aquatic Superstore.

Delivery Service available

Open:

Monday, Tuesday, Wednesday & Saturday
9.00am - 6.00pm
Thursday, Friday
9.00am - 8pm
Sunday
10.00am - 5pm

Coffee shop now open
Parking at rear for 40 cars



KOI CALENDAR

By
DAVID TWIGG

Jobs for the Month

I look forward to this month every year as it marks the start of spring, the time when, hopefully, the weather is improving, the daylight hours are lengthening and water temperature is once again starting to rise. Fish activity begins to increase and, subject to temperature, feeding will probably commence.

1 If feeding is started, then an easily digestible food should be chosen. Wheatgerm pellets are generally recommended to start the digestive system working again, but these are very hard and may well benefit from being soaked for a while, to soften them up before feeding to your Koi.

My favourite start-up food is boiled wheat (or barley) which Lyn buys from our local supermarket. A cupful of wheat and three cupfuls of water are placed in a bowl (suitable for the microwave) and then cooked for about ten minutes. When thrown to the Koi, the wheat sinks to the pond bottom and is easily taken from there.

When feeding, I would suggest that:

i) a watchful eye be kept on the weather forecast for sudden cold spells and

ii) that the feeding rate be arranged that water quality does not suffer.

If the filter flow rate has been reduced over the winter months, this may need to be increased slowly as water temperature and feeding levels rise.

Brown bread is another easily digestible food which can be given at this time of year. The bread can be easily broken up and rolled between fingers and thumb to produce small balls which, when thrown into water, will also sink to the bottom.

Whatever you decide to feed your Koi, it is probably wisest to build up the quantity gradually to allow bacterial activity in your filter to re-establish itself without being overloaded. This will minimise the likelihood of subjecting your Koi to an ammonia and/or nitrite surge.

2 Water quality is of paramount importance at this time, when Koi are at their weakest after a long British winter. Regular checking of water quality is, I believe, a must, as poor quality can cause severe damage to, for instance, the gills.

3 Another of the problems encountered when a filter is not fully established is the 'flicking' caused by the irritation of the skin. When a fish rubs itself for prolonged periods of time, it is likely that a wound will be opened up which will then allow those ever-present enemies, the opportunistic bacteria, to get inside the wound, causing the inevitable problems

of treatment at this very difficult time of year. Most treatment will have little, if any, effect at temperatures below 10°C (50°F) ... very stressful for both Koi and keeper alike.

4 If your pond has been covered for the last few months and pond maintenance has been put on hold, then it would probably be wise to 'vac off' the pond bottom. Even though the Koi have not been feeding, a certain amount of

waste will have been produced and dead algae will almost certainly have collected in the quieter water areas. Try not to disturb the Koi too much with your pipe-work by (perhaps) carrying out the job in stages.

International Koi Show (UK), Telford Exhibition Centre, 30 April-1 May Tel: 0922 493290

Thoughts for the Month

Are you building a new Koi pond this spring? Are you considering extending your existing pond system to cater for that ever-growing and expanding Koi collection? Are you a member of a Koi club?

If your answer to this last question is no, then please give consideration to contacting one of the rapidly growing groups of Koi keepers in the UK and abroad. The knowledge these groups possess may well help you save a lot of time and money, as well as maybe offering design improvements which you may not have considered.

Contact any of the names in the Diary on this page, and I am sure that you will receive a warm welcome. The show season is almost with us and, for the benefit of the newer converts to this wonderful hobby of ours, I will outline the way shows operate.

Shows are generally described as 'Open' or 'Closed'. An Open Show, as its name implies, is open to any Koi keeper who wishes to exhibit his/her Koi. The 'Closed Show', on the other hand, is for members of the organising body only. Both shows are generally open to the public for viewing and there are normally Koi-oriented dealer stalls as well as, say, craft fairs and children's entertainment.

Some shows are described as being *Japanese Style* and others as *English Style*. The former is where Koi from entrants are mixed, variety by variety, and the latter is where each exhibitor is allocated a vat (portable pond) in which only his/her Koi are on show.

Both methods of showing Koi have their good and bad points, and it is up to the prospective entrant to assess how these points will affect his/her.

If any details are not given or are insufficient for a decision to be made as to showing or visiting any particular show, then the contact names in the Diary will be pleased to fill in the gaps. If you get to any show at which you spot me in the crowd, please say 'Hello', I look forward to meeting readers and putting faces to names.



The show season gets under way next month. Make sure you get round to visiting at least one of the 'majors', like Koi '94 to be held on 13-14 next August at Billing Aquadrome. JOHN DAVIES

What's on in March

2 — Leicestershire Koi Society. Wayne Eady on Bringing your Koi out of Winter. British Shoe Corporation Social Club, Leicester. Contact Pip Ostell, 0533 609707 or Kevin Luckman, 0455 250413.

8 — Nottingham & District Section BKKS. Talk with video on the Koi scene in the Far East. The Western Club, Derby Road, Nottingham at 8pm. Contact Shirley Hind, 0602 810923.

— Yorkshire Section BKKS.

The Holme Lees Inn, Osselt, Nr. Wakefield. Contact Fred Harston, 0226 722578.

9 — South Hants Section BKKS. Club meeting, 8pm.

Denmead Church Hall, Hambledon Road, Denmead, Hants. Contact George Rooney, 0420 473169.

— Merseyside Section BKKS.

Speaker: Paul Stacey of Shirley Aquatics, Millbrook Manor Restaurant, Knowsley Village.

Contact Robbie, 051 549 2001.

12 — Heart of England Koi Society. Monthly meeting in Warwick. Contact me on 0926 495213.

13 — Lea Valley & Harlow Section BKKS. Speaker: Frank Prince-Iales, 3pm, Halling Hill Common Room, Harlow. Contact Phil Davis, 0279 443754.

— Mid-Somerset Section BKKS. West Monkton Village Hall. Speaker: Geoff Lambert of PROKoi, on Koi nutrition and production. Contact Alan Purnell, 0458 72132.

— Central Section BKKS. T.P. Riley Community Centre, Bloxwich. Contact Sue Finney, 021 747 2733.

— Northern Koi Club. Speaker: Paul Stacey from Shirley Aquatics, All Souls Church, Salford. Contact Tony McCann, 061 794 1958.

14 — Northampton Section BKKS. Monty meeting, Saints Social Club. Contact John Byles, 0604 718648.

16 — Crouch Valley Section BKKS. Spring revival by Nikki Chapple of Koi Water Barn. Meeting in Laindon, Essex. Contact Ron Parlour, 0277 840863.

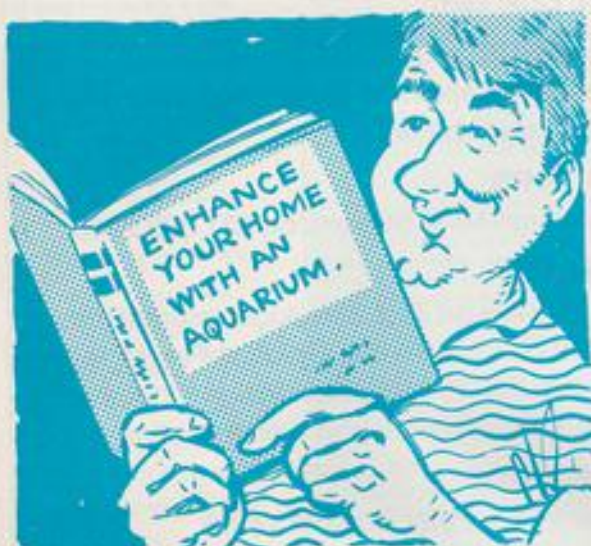
20 — Scottish Section BKKS. Meeting at 1pm, United Glass Social Club, Bridge of Allen. Contact N. Raffell, 0337 830142.

Reef Hunting

Sid Goes

Well, not Sid himself, exactly. But when *Aquarist & Pondkeeper's Sid's Fishes'* cartoonist, **John Anderson**, heard about an aquarist who'd gone through hell, high water and his living room wall for his hobby, he just had to look into it ...

Illustrations by the author



I've got to come clean. This article started as a bit of a joke. Well, part of a cartoon really, where our hero is so proud of his amazing new tank that he's forgotten to put any fish in. During a fit of responsibility unusual in a fish cartoonist, I decided to get my facts right.

I called in at my local fish shop, the Reef and River, to check out what a stupendously hi-tech set-up might look like. While helping me out (which way had I come in?) the assistant mentioned a customer who had just spent a year putting together a state-of-the-art marine system.

Now, I knew some of these foreign assembly instructions could be confusing, but a whole year?! "Where does he live?" I asked. "And does he talk to cartoonists?"

Salt water keeper

Brian Bleasdale, it turns out, lives with his wife, Jan, and 1000 litres of salt water, above their hairdressing salon, 'Heath-clipse', in Morecambe. He happily accepts my excuse for calling by, i.e. blatant nosiness, and begins by telling me that the whole skill of the hobby lies in the keeping of water.

Do that right, he said, and the rest looks after itself. "But you do keep fish as well as water?!" I asked, slightly worried. "Not really", he replied, "just a couple of Mandarins and a goby." "This bloke's nuts!" I thought.

Then we entered his first floor living-room, and I'm stopped dead in my uncharitable thoughts. Brian's nuts alright — about invertebrates! In front of me stands a great dazzling panorama of living reef, in living technicolour.

Big?! You could practically scuba dive in the thing! Experience the wonders of the deep from the safety of your own slippers! And it was scuba diving, handily enough, that first got Brian interested in invertebrates. In the Red Sea, no less, during time spent working as an engineer in Saudi Arabia. On returning to Britain he kept marine Angelfish and the odd polyp for a while, but like all good reef diving engineers, soon fancied something more ambitious than his six-foot undergravel filter set-up.

And so it was, over eighteen months ago, that plans were drawn up for the piece of aquatic hardware that was to give London Zoo an inferiority complex!

At this point, I should issue a warning.

The procuring of complicated, oversized aquaria can test your patience, sanity and marriage to ludicrous extremes, not to mention seriously damaging your wealth.

It begins easily enough. In this case Brian contacted the aforementioned fish shop, who put him on to a Minireef (now Aquareef) distributor. Then he waited for four months while a tank and cabinet were imported from Holland. On arrival, it took six people to heave the apparatus up the stairs and into the living room through a specially demolished wall.

Cracking time

So far so good. But then someone noticed a small crack in the glass. A man from Minireef was called for, who called for a replacement tank, this time from Germany.

While contemplating his second lengthy wait, Brian received another delivery from the Netherlands, a crate of broken glass with the words 'trickle filter' stencilled across the outside. This, too, was sent off for replacement with the new sensible perspex model.

Then the wall came down again for the

in Morecambe Bay



The inhabitants of Brian's 'reef' clearly love the conditions he's provided for them.

second tank, which was, fortunately, undamaged. Unfortunately, it was also the wrong size for the original cabinet, which was next for replacement!

By this time, I suspect Brian was having grave doubts about the supposed therapeutic joys of fishkeeping. Eventually though, everything came together at the

right time ... Only not in the right place. Jan wasn't keen on the tank's position in the room, and he agreed that the lights interfered with the telly. So another stretch of floor and ceiling were reinforced, and tank and lighting moved around the corner, where you can find them, mercifully static, to this day!



Brian and his 'reef' set-up. No look really 'doesn't' fit!

Vital statistics

The tank measures 250 x 60 x 76cm (98 x 24 x 30in), and is lit with 2 x 250 watt and 2 x 150 watt lamps, plus 2 x 8 watt actinic blues.

While we'd been talking, Brian had removed the cabinet base panels to reveal what looked like a small subaquatic industrial estate. "The filtering starts at the mains," he tells me, pointing out the Reverse Osmosis unit he'd just installed. "It makes the tea taste nicer too," he adds, and hands me a cup.



The heart of the set-up ... a water control system second to none.

Back in the tank, water enters the spiral pre-filter via an overflow. Half then runs into a wet and dry filter, and half into a trickle filter containing Bioballs and also cable heating. Various proportions then pass through the nitrate filter, protein skimmer and ozoniser before being pumped back into the tank, with a quick final charcoal rubdown on the way.

The system is built mainly from Aquareef and Dupla parts, with a few added extras.

I'd just about got all this sorted out when the side panels were opened, behind which lay rows of black boxes, dials and digital displays. Temperature, lighting, salinity, pH, ozone, trace element content and even water level are constantly regulated and automatically adjusted.

To know exactly how this works you'll have to ask Brian yourself, or take night classes in advanced circuitry for fish keepers. But I can tell you it does work; I've never seen such well kept water in all my life!

Thriving community

The water's inhabitants seemed to be of a similar opinion; it was hard to believe that the first pieces of living rock only went in six months ago. First to thrive and multiply were the Pulse Corals, several species of *Caulerpa* seaweed, and red algae. The reef has grown steadily without setback, and now includes Brain, Bubble and Cauliflower Corals, anemones, polyps, mangrove shoots, a cute performing clam and plenty more I've forgotten or can't pronounce.

To be fair, Brian can't name everything in the tank himself, due to the unpredictable content of living rock. He points out a suitably enigmatic orange and black striped flatworm to illustrate. Apparently, there's a far less welcome rogue Mantis Shrimp just appeared on the scene too, lurking out of reach in the substrate.

And so I'd come to the end of my tour. An innocent, if daft, question in a fish shop had uncovered an epic saga, where one man takes arms against a sea of troubles, and ends up with a magnificent invertebrate tank. Did Brian think it had all been worthwhile? "Well, Jan likes it now it's up and running, and I'm pretty happy, but there's still more to be done ..."

Brian's a modest bloke, and an incurable perfectionist. I'm sure you don't have to spend colossal amounts to keep invertebrates (he could have had a fair few scuba diving holidays for the final cost) but the results weren't half stunning. And I'm not saying that because he promised me a free haircut downstairs ...!!

NEW
SERIES

DISCUSSIONS



Steve Dudley of Euro Discus UK, begins a brand new regular series for Discus lovers.

Welcome to **Discussions**, our regular section for Discus keepers. Whether you are new to this exciting hobby or have been keeping Discus for years, I hope you will find something of interest in my subject choices.

If you do, please write and tell me. If there's anything which you think I should be looking at, then tell me as well. Send me your news, views, opinions, pet loves, pet hates ... anything, in fact, which you feel warrants an airing in this section. We look forward to hearing from you.

[While, as Steve says, we will be delighted to receive your letters, any queries requiring a response should still be sent to Dr David Ford via **Question Time**. Ed]

Now on with the show ...

Diets

When proposing a dietary plan for a creature kept in captivity, we need to understand that there are certain components required in order to keep it in good health. These basic components are to be made up of proteins, fats, carbohydrates, minerals and vitamins. All are required to sustain a healthy existence.

For years Discus enthusiasts have prepared their own diets, some good, and many not so good. Most are based on beef heart mixes, to include other various additives.

Discus need plenty of protein, and these fall into two categories: plant protein and animal protein, the latter containing a higher supply of amino acids, which are of a higher quality, than the former. It is therefore essential to include, as a basic requirement in your feeding regime, meat, shrimp, fish, insects and larvae.

Amino acids are the building blocks of living tissue, so young Discus require a lot more of them than fully grown specimens.

Other foods, such as flake, also contain essential fats, carbohydrates, and many have added vitamins and minerals which help to provide a reasonable diet. Another good food providing both protein and roughage is freeze-dried Tubifex; it is also quite safe to use and the Discus really enjoy it.

pH collapse

The water quality within the Discus aquarium can decline quite rapidly if certain factors are not checked. These can also have adverse effects on the inhabitants.

We tend to keep Discus at fairly high temperatures — 30°C (86°F) — because they have a higher metabolic rate than that of most other tropical fish. All Discus species need to be fed great amounts of food and given regular changes of water in order to keep waste by-products to a minimum.

The easiest way to keep a healthy aquarium is to have a daily routine.

Most Discus are kept in soft water with very little carbonate hardness content, so these aquaria tend to have an unstable pH, and are more susceptible to pH 'collapse'. This has serious effects on the beneficial bacteria and can also cause 'burns' to the fins and eyes of the fish. To the inexperienced keeper, these 'burns' can be mistaken for a bacterial infection, so medication is given ... and the Discus look even worse!

The first thing I do in the hatchery, is to check the pH in all tanks. If it is below 6.5, I then add a little bi-carbonate of soda until the value rises to 7 (i.e. neutral).

Raising the pH rapidly in this manner will not hinder the Discus in any way; in fact, they would

probably thank you if they could talk.

The collapse is caused by acid produced by bacteria in the biological filter, which, in turn, causes the destruction of carbonate buffers present in water. Sometimes, a good water change and a cleaner filter would help eliminate such an unstable environment.

With gravel set-ups, a weekly water change using a gravel cleaner would be acceptable. For the enthusiasts who have bare aquaria, uneaten food and other debris need to be cleaned on a daily basis.

Angel compatibility

"Can I keep Discus with my Angelfish?" Answer: "Yes, if you want, but I would prefer to keep them in separate aquaria."

Have you ever seen what damage Angelfish can do to themselves? I have been to many Angelfish hatcheries and can remember one in particular. When initially viewing large fish in an aquarium containing 20-30 individuals, they all looked quite placid and graceful. They were magnificent specimens, but, on close examination, there were at least 15 casualties which had suffered severe eye damage, caused by other Angelfish ... often, the spawning partner.

This became apparent to me as I watched a pair which were tending their young in a breeding tank. The male was trying to attend to the spawning site where the fry were still adhered to the substrate. His mate, however, wanted to take charge, so

she kept the male at bay by pecking him and butting him in his eyes with some force. I asked the breeder and he confirmed that spawning Angels can be extremely territorial and aggressive.

So I think the choice of whether to keep Angels and Discus together or not, is quite obvious. Another 'excuse' for keeping Angelfish out of the Discus tank is that Angels are said to carry *Capillaria* (Threadworm). This nematode is quite a common intestinal parasite of both Discus and Angels, so when I hear enthusiasts referring to an Angel infecting Discus with *Capillaria*, I have to put this down to just another one of those myths.

Three Golden Rules

- 1 Never be tempted to allow new stock to contaminate your existing aquaria. Always quarantine new Discus in a separate tank, even if they look in good condition. Unfortunately, many keepers put healthy stock at risk in this way and may suffer grave losses. The most common known result is the dreaded 'Discus Plague'. I will address this problem in my next column.
- 2 Never change more than a third of Discus water in one week, as beneficial bacteria will not be able to reproduce quick enough to keep metabolic wastes down to a reasonable level.
- 3 Check the pH daily. Many serious problems can be avoided if this rule could be adhered to.



Bare Discus tanks may be easier to keep clean than fully furnished ones but what do you think of them? Drop us a line.

STEVE DUDLEY

You can keep them; you can cook them ... and they look like sausages. Yet, behind their usually inactive exterior, sea cucumbers hide a wealth of unusual and intriguing secrets. **Dr Lin Baldock** reveals a few of them.

Illustrations — unless otherwise indicated — by the author

SEA CUCUMBER

Secrets



The Cotton Spinner, *Holothuria forskali*, a species very common around the UK, showing a tangle of Cuvierian tubules ejected from its cloaca after it had been handled (see text for details).

The sea cucumbers are, at first glance, unprepossessing marine invertebrates and unlikely cousins to the delicate feather stars. These inelegant, sausage-shaped animals belong to the phylum Echinodermata in the class Holothuria and are, hence, related to starfish, sea urchins and the crinoids or feather stars. The bony exoskeleton (external skeleton) typical of these groups has been reduced in the sea cucumbers to elaborately shaped ossicles (bones) buried in the skin.

A close look at the biology of sea cucumbers reveals some fascinating features. For example, they range in size from a few centimetres up to lengths of over a metre (over 39/40 in) with a diameter of as much as 20cm (8in). Their habitat range is wide too, occurring from the muddy plains of the ocean depths, right up to the intertidal zone of coral reefs and on our British shores.

Amazing guts

Sea cucumbers are particle feeders and the group has two basic ways of collecting food. There are those with ten or more feathery tentacles which sit, virtually immobile, trapping plankton from the water around them. It is these species, particularly the strikingly coloured ones from tropical waters known as 'Sea Apples', which are often seen in tropical aquaria. They will do well if provided with plenty of fine food. Some species can even trap adult beine shrimp!

The other major group of sea cucumber



Diagram showing details of the feeding tentacles of the Red Sea Cucumber.

Close-up view showing the mop-like feeding tentacles of a sea cucumber from the Red Sea. (see accompanying diagram)



feeds on particles of detritus (rotting organic matter) on or in the mud or sand in which they live. These species have tentacles which they use rather like a mop. They dab delicately over the mud surface trapping small particles in a sticky secretion on the tentacles. The bits and pieces are then wiped off the tentacles into the mouth, rather like someone licking their fingers after eating a doughnut!

In some tropical areas, there are huge densities of sea cucumbers. For example, it has been calculated that in an area of one hectare (10,000sq m which is roughly equivalent to the size of two soccer pitches), the population of holothurians can process 150 tonnes of sand through their guts each year. They need to handle such large quantities of sediment in order to obtain enough nourishment from



A dense population of sea cucumbers, *Holothuria* sp., on the reef flat of a coral cay in the Swains Reef complex of the Great Barrier Reef.

A close up of the colourful skin of the large sea cucumber *Bohadschia argus*, a particularly toxic species used for fish trapping.



among the sand grains to keep them going.

Their characteristic piles of droppings, resembling strings of diminutive sausages, can be seen scattered everywhere. Thus, sea cucumbers play a vital role in the sediment processes of some coral reefs.

Spectacular defences

At first glance, sea cucumbers appear rather vulnerable to predation. They often lie in the open on the reef flats of coral reefs, or conspicuously on the rocky seabed among kelp. However, they do have several defensive tricks up their sleeve, so to speak.

Perhaps the most spectacular is the habit of discharging a tangled mass of sticky white threads (Cuvierian tubules) from their anus when irritated. This is the habit which gives the common black British species, *Holothuria forskali*, its English name of 'Cotton Spinner'.

These threads enmesh their would-be attacker. Furthermore, the threads are impregnated with toxic chemicals called 'holothurins' which will kill fish and crabs. The tubules regenerate gradually over a period of weeks. It is probably a good idea to wash these threads off your hands thoroughly should you be 'attacked'.

Not all species produce Cuvierian tubules — some are capable of discharging all their intestines, yet still survive to regenerate another set. Other species rely on the toxins impregnating their tough, leathery skin. These block the conduction of nerve impulses, among other things.

Backdoor breathing

Another 'quaint' habit of the holothurians is that they breathe through their cloaca (next to their anus). Water, with a fresh supply of oxygen, is drawn in here and circulated through a complex system running throughout the body called the 'respiratory tree'.

Taking advantage of this continuous supply of water is a specialised genus of fish known as Pearlfish (*Carpot*). These fish find shelter inside the body cavity of the sea cucumber, emerging only to feed.

Sea cucumber soup

Rather surprisingly, perhaps, sea cucumbers have been exploited by humans. In the Far East, several species are collected for food and are known as *trepong* or *biche-de-mer*. The latter French name is a corruption of the Portuguese *bicho de mar*, meaning 'sea worm'.

Because of the toxic chemicals produced by holothurians, those to be eaten require careful preparation and the right species must be selected. One of the most sought after is the Prickly Red Fish, *The-lanota anas*.

First, the animals are boiled for twenty minutes to half an hour. They are then split open, cleaned and dried in the sun. This is followed by twenty-four hours in the smoker — the best over the wood of the Red Mangrove. Finally, the *trepong* is dried further, after which the product will keep indefinitely, provided that it does not become damp. The dried sea cucumbers

We're Making Waves!

3Wavemaster™
Powerhead control system



Innovative controller randomly switches powerheads to replicate the motions of the sea.

- 1,2 or 3 powerheads - triple wave action
- Automatic operation
- Soft-start to protect powerheads
- On/off switch (for feeding)

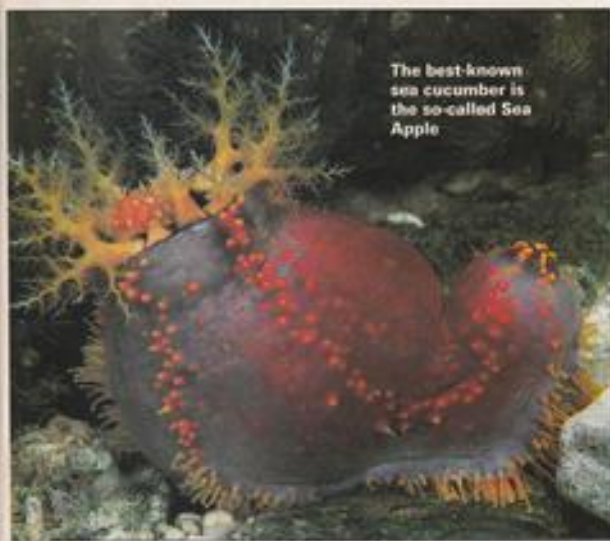
Water motion plays a vital role in creating a *Wavemaster* Coral Reef environment. Constant and changing patterns of circulation are critical to supply oxygen and to remove waste products.

This powerhead control unit creates randomly flowing, ever-changing water currents, which are indistinguishable from the natural environment. The effect the *Wavemaster* creates in the home aquarium is dramatic and corals thrive as never before!



Red sea fish pHarm Ltd.

Distributed by
CORAL REEF TECHNOLOGY LTD
62 HIGH ROAD, BYFLEET
SURREY KT14 7QL
TELEPHONE 0932 355121



The best-known sea cucumber is the so-called Sea Apple

COURTESY: JAMES MORGAN FOR THE BIRDAVISORY

can then be used to produce stock for soup and curries. It is the careful and prolonged heat treatment which is essential in order to destroy the poisons which would otherwise make the broth a real witch's brew.

The poisonous properties of sea cucumbers are also put to good use by man. In the Philippines and other Pacific islands, large numbers of holothurians, such as *Bohadschia argus* and *Holothuria atra* (no common names), are collected, cut up and thrown into pools on the reef. Toxins are released from the damaged flesh, poisoning the fish hiding in the nooks and crannies among the coral. The dead fish then float to the surface, where they are easily collected. This is, of course, a very unselective way to fish, as all species are killed, not only those which are suitable for food.

Aquarium cucumbers

Sea cucumbers are not always spectacular inhabitants of a home aquarium; furthermore many species are relatively large. In general, they are rather difficult to keep 'existing' for a time, then often gradually fading away. The filter feeders need large quantities of liquid invertebrate foods to thrive, though some species can cope with brine shrimps. The sediment feeders must process large volumes of material with its associated organic matter in order to keep going.

I have kept the long, grey worm-like *Synapta maculata* for a time in an aquarium with running seawater. Another species which is relatively easy to keep is a small, compact one, the Feather Cucumber, appropriately named *Cucumaria minima*. A particular point to recommend this species is the fact that it does reproduce in aquaria: clusters of miniature individuals may appear in the aquarium where there are two or more adults.

The best-known and most often seen species for tropical marine aquaria is the brilliantly coloured Sea Apple (*Pseudocolochirus axiologus*) which is as beautiful as it is easy to keep.

As you can see, sea cucumbers have plenty of interesting biological features which I have only been able to touch upon in this short article. People have spent lifetimes studying this diverse and intriguing group ... so, if you'd like to delve deeper into the world of holothurians, one thing's certain: there's no shortage of information. It's just a question of finding it!

APP

**FOR 16 PAGES
OF VALUE EVERY
MONTH from
ANIMAL HOUSE**
send for our separate 'Aquarium
& Pond Buyers Guide'



10th issue **FREE** listing
over 1,500 bargain items!!!

For Your Free copy phone **0924 479946**
or post the coupon & we'll send one immediately.

Please rush me your free Aquarium & Pond Buyers Guide

NAME

ADDRESS

POSTCODE

Animal House (U.K.) Ltd. Dept A&P10, Q.B.M. Business Park,
Gelderd Road, Birstall, Batley, WF17 9GD. Tel 0924 479946

Welcome, I hope that you are all sticking firmly to all of your New Year's resolutions! I failed at the last fence in my attempt to have at least one year free from the past twenty-one of the 'Bandage Factory's' attentions.

I had to go in shortly before Christmas, then I was home for Christmas ... but then was back in again just afterwards. It was very well worth all of the upset and aggravation, though, because the treatment was a complete success, and I shouldn't have to worry about matters medical for a long time to come.

Free at last, and never feeling better. It's nice to nick yourself shaving and see bright red spots of the red stuff for a change!

Viviparous update

I received a very encouraging letter from Peter Day in response to my January column's appeal for volunteers (abled and disabled, of course) to assist Graham Seddon of the above society with breeding programmes to produce very high-quality Guppies. I said at the time

Reflection time

Remember why you came into the hobby in the first place? It saddens me to see a fish tank which has obviously had a great deal of time and money spent on it, and the owner and his/her family walking past with hardly a glance at their carefully crafted work.

Why not make a point in switching off the one-eyed monster, and gather the family around the aquarium for half-an-hour each evening?

HELPING HAND

BY KEVIN FOX



that you didn't necessarily have to have any knowledge on the subject at all, as I am certain that Graham would supply any information a potential volunteer would need.

From the reading of Peter's letter, he certainly sounds like he's a very able fishkeeper indeed. Peter, like many dedicated fishkeepers, is planning to convert an ex-garden shed into a fish house, and once this has been completed, he plans to involve himself in the High-Quality Guppy Breeding Programme. Since I wrote the above, I've received a load of letters on Graham Seddon's proposals. They've all been passed on ... so please keep sending them in. The more the merrier!

Having once had my own fish house way back when, I know the difficulties (and the expense!) which lie ahead of Peter. But the rewards make it all worthwhile. Building your own fish house allows you the freedom to pursue as many different themes as you like: breeding programmes, fry bringing on, hospital tanks etc.

For example, I needed my own fish house so that I could set up all the various aquaria for photography. Doing this allowed me to

photograph fish from any possible angle — straight up from the bottom of a tank, downwards onto light-coloured sand etc. All very worthwhile, but also very expensive.

Please keep us informed of your progress, Peter — a photograph of the finished fish house would be nice. May I also urge you to keep in contact with Graham about your plans? As I said back in January, this is a golden opportunity for disabled AND able-bodied aquarists to become involved with work of real scientific value and worth.

You will find yourself involved with aquatic dietary matters, piscine biology and lots of other chemical sciences (but only if you want to be; they are NOT a condition of the breeding programme). You will be adding your little bit of discovery to the sum of the knowledge on the subject. Of course, I and all of our readers will be very interested in anyone's plans to involve themselves in this breeding programme, no matter at what level you choose to enter it. Who knows, you may even develop a whole new strain of the species ... and have it named after you!

Mailbag

My thanks to both Paul Szymanski and Peter Day for taking the time to write, and, of course, to everyone who takes the time and trouble to contact me via HH. Please keep 'em coming, I've long hoped that this part of the magazine should in the main reflect your thinking, and not so much mine!

Don't worry Paul; I am working on your piece for HH. I've only been allowed out of bed during the past week and have masses of stuff from other sources to deal with as well. Once again, my monthly postage bill is fast approaching Third-World National Debt proportions!

On the subject of posting, would all of the prize winners from the competition please bear with me for a (very) short while longer, and NOT write into the 'office' asking where their prizes are? I have them. They are all quite safe and you will receive them shortly.

What happened was quite simply I did not want to entrust the various parcels into the postal system at its most critical time, eg. Christmas. It was my intention to post them all off immediately after Christmas to ensure that you all received them in good order. Unfortunately, being back in hospital, I wasn't around to see to their posting. Now that I am out again, it is my highest priority, and you shall all receive them before much longer. You have my word on that!

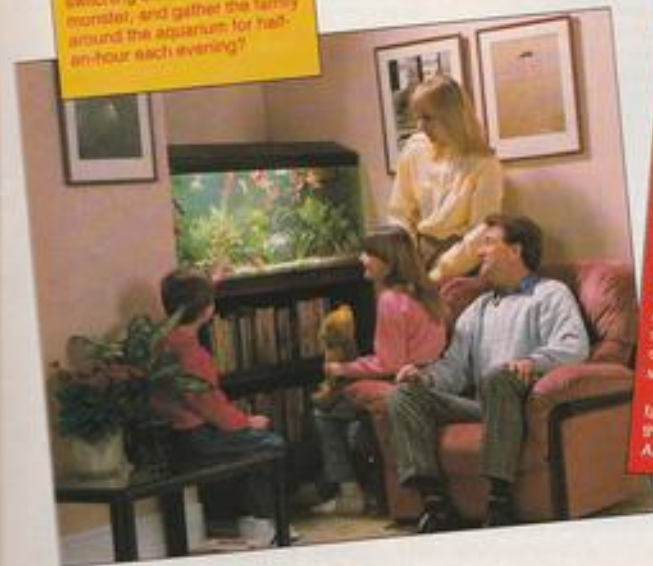
Please address all correspondence for this page to: Kevin Fox, Helping Hand, A&P, 9 Tufton St, Ashford, Kent TN23 1QN

FISH & TIPS

Not only is nature still fairly dormant at this time of the year, but some aquarists' shops seem to have been so as well. Of course, winter is not the time to start any major refurbishment work on your aquascape or garden pond etc. Neither do the shops, I suspect, expect to be inundated with new customers. But, when everything is still relatively quiet — before the 'rush' of spring — wouldn't it be a good idea for a local aquatic club or association to seek sponsorship from a local shop and set up an aquatic Open Day?

I am involved with many other groups and associations, many of which could easily be described as 'Minority Interest' — less than a thousand people in the whole country involved. Yet, in all of these societies, one of our highest priorities is to make the general public aware of exactly what it is we do. We achieve this by actively seeking sponsorship (not necessarily money: equipment is very often more important) from local dealers, and then borrow somewhere to hold a 'Hands-On' display.

The results of such 'Open Days' are virtually all very positive and favourable, and, sometimes, new members are recruited. But all of this is merely incidental to the main theme. And this is: 'Here We Are. This is What We Do!'



Books

Marine Aquarium Keeping (Second Edition)

By: Stephen Spotte
Published by: John Wiley & Sons, Inc.
ISBN: 0-471-59489-X
Price: £16.50

"This is a no-frills, no-nonsense book about marine aquarium keeping written for beginners."

These are the opening words of the Preface to *Marine Aquarium Keeping*. They thus lay down the terms of reference for a book which is eminently readable and useful, albeit difficult-to-accept at times. The author is a believer in the principle that (quote): "Biology, not gadgetry, is the platform to success," and, as a result, gives prominence to the animals, with equipment playing a supporting role.

As someone who has kept marine fish and invertebrates in 'low-tech' set-ups, and even bred some species under these conditions, I can vouch for the fact that it is possible to do so without courting disaster. Equally, I have found that the use of sophisticated equipment has been extremely helpful, particularly where delicate species are concerned.

The reason why I raise these points is that while, as a biologist, I respect and accept a great deal of what Stephen Spotte has to say about aquarium equipment and management, I cannot go as far as agreeing with his apparent rejection of advanced maintenance aids. He states, for example (on page 152) that: "The most presumptuous myth of all is embodied in the belief that the chemistry of marine aquarium waters can be kept in a semblance of steady state by power filters, foam fractionators (protein skimmers), ozonators, and other water treatment devices" (my emphasis).

Elsewhere, he says that, when introducing new fish into an aquarium, "flota-

tion achieves nothing". He then goes on to advocate the immediate release of fish into "a quarantine aquarium as soon as you get home". It's difficult to reconcile this advice with that usually given, which states that the equilibration of temperatures, allied to gradual mixing of aquarium and bag water, will at least help a newly-bought fish to begin to become accustomed to its new environment.

Marine Aquarium Keeping challenges some of the very cornerstones of the modern-day marine aquatic hobby, labelling many of them as "myths". In so doing, it performs a marvellous job of getting the prospective and the established, aquarist to think seriously about all aspects of the hobby. This is, undoubtedly, a very good thing, since we all know that expensive, state-of-the-art equipment does not, of its own, guarantee success. It is a sound knowledge of the basic all-important principles that leads to life-long enjoyment and fulfilment.

I applaud the author for having the courage to challenge so many of our long-held beliefs and for forcing us to consider the deeper aspects of these beliefs. I do, however, feel that, by mounting such an all-out attack, there is a possibility that some beginners might end up rejecting the good as well as the bad ... with potentially disastrous results. This, I believe, is not what the author had in mind when he set out to write this thought-provoking book.

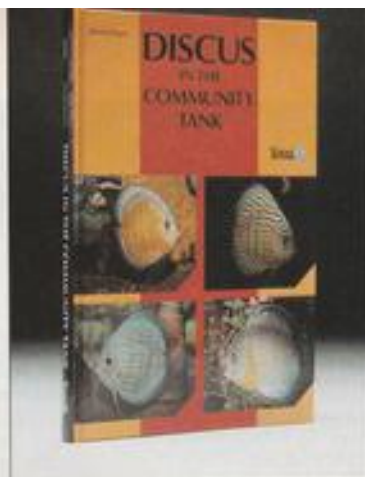
John Dawes

Discus in the Community Tank

By: Bernd Degen
Published by: Tetra
ISBN 1-56465-121-5
Price: £12.25

Most hobbyists regard Discus as specialised fishes needing equally specialised care and conditions, yet Bernd Degen, an accredited Discus expert, offers an apparent contradiction to that view.

To understand the aquarium requirements of any fish, let alone Discus, it is first advisable to learn about its natural



way of life, and so the Amazonian scene, the origins and historical details of the species are discussed. Wild species are described, followed by the increasing number of cultivated, or captive-bred, varieties. Will you do better keeping wild-caught specimens or tank-bred fishes? A useful chapter will help you to choose, along with how to select healthy stock from whatever source you finally decide on.

Again, setting his face against the norm, the author describes setting up a fully-furnished Discus aquarium; there is a good suitable plant section (no more bare tanks) followed by compatible, and companionable, fishes.

Proper Discus care relies on correct water quality and the right foods; these are explained and, as a logical progression from the combination of these two factors, breeding then takes up a major section. Disease prevention, plus diagnosis and treatment in tabular form, is also included. The book closes with Ten Golden Rules for successful Discus keeping.

By treating Discus as just another aquarium fish, the author has one main aim — to bring to the widest audience possible, the attractions of these magnificent fishes. By showing how to set up the more conventionally-furnished, planted aquarium in which they can not only survive, but thrive (and breed), he may well have done a worthwhile service for us all, and especially for the Discus itself.

Dick Mills

ADD PRIDE TO YOUR POND
&
WATCH YOUR FISH GROW

POND PRIDE full of energy and body building protein
See your fish darting to the top in a blaze of colour
Make your pond a sight to be proud of!

King British Fish foods & Water treatments
"The perfect combination for those who just want to do it better"
On sale at Garden centres, Aquatic shops and Pet stores





LINDA LEWIS

Some thoughts on choosing goldfish

- 1** Health is always the first consideration; no matter how special a fish may be, it's no use unless it lives!
- 2** Fish kept purely for pleasure need not conform to any Standard or type; they only have to please you!
- 3** All the major organisations have Show Standards for Goldfish. Choosing fish to show requires at least some knowledge of the relevant Standards.
- 4** For breeding purposes, fish from an unknown source are a 'shot in the dark'. However, with imported fish, you often have little choice, except to take a chance.
- 5** Because it has taken hundreds of years to develop the present varieties, indiscriminate crossing of Goldfish is frowned upon. Improving strains and developing new varieties sometimes entails crossing. However, this should always be done under controlled conditions and the results properly identified.
- 6** Offspring must never be passed on under the guise of something they are not.

It may not be a show stopper, but this Common Goldfish is a perfectly acceptable fish for the general Goldfish keeper who does not intend to enter fish in competitive shows.

A Fish for all Seasons

PART 3

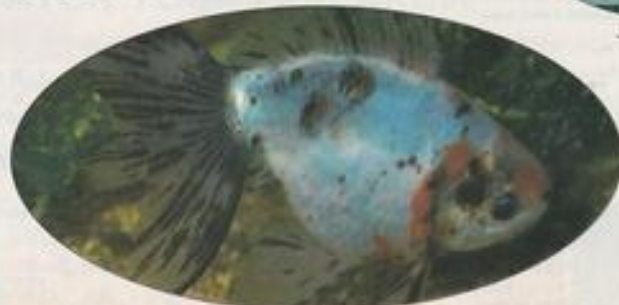
Choosing Goldfish

Goldfish expert Alex Stephenson rounds off his personal guide to his favourite fish.



A top-quality Yokohama-type Ranchu.

JOHN DAVIES



A good-quality Calico Fantail. Whether it would win any prizes would depend on what standards it would be judged by ... and on the quality of the competition.

GORDON WIGENS

If you decide to go in for Goldfish, you could find yourself spoilt for choice, since it is said that there are over a hundred recognised varieties. Of these, a dozen or more are easily obtained in the UK; more still can be found from time to time, but usually only at establishments catering for Goldfish enthusiasts.

If what you want is a pretty fish which is not necessarily a pedigree specimen, your general aquatic shop is likely to be as good a place as any. For those requiring something more, it pays to find a specialist.

Sorting grades

When studying Goldfish with a view to purchase, it may help to know what you are looking for.

Not always, but more often than not, the larger fish are of better quality than the smaller ones. The reason is that

breeders produce large numbers of fish. The 'rubbish' is culled and the 'acceptable' grown to saleable size, at which point they are re-sorted.

Those fish considered good enough will be retained to 'grow on', the rest go to market; these are 'the smalls'.

How many fish are retained often depends on how much space the breeder can allow for them. He/she won't crowd youngsters, as this stops them growing. This means that good fish can

sometimes be found among 'the smalls'. In due course, the better fish, now larger, will be sorted again and graded for sale. Anything really special may be kept for future breeding stock or held for customers prepared to pay a high price. I've simplified this a bit, but I'm sure you've got the picture.

Choosing good fish

Normal rules of fish buying apply to Goldfish, health being the paramount consideration. Ask the right questions. Where are the fish from? How long have they been in the country? What medi-

cation have they had? Are they feeding well? etc. If you are happy with the answers, spend some time observing the fish before making your final choice. Avoid anything which isn't alert and moving about with 'purpose'.

Technicalities concerning shape and colour are only important if breeding or showing is intended. Selecting 'show' specimens requires a working knowledge of the variety concerned. Nothing is perfect, and all fish have faults. Some are minor and will only set you back a few points on the show bench. Others, which might not look serious, can cause judges to write meaningful but indecipherable messages on judging sheets!

National standards

Goldfish have always been subject to a number of varying sets of show standards, each organisation having a different perception of the ideal. This situation still exists, but to a lesser degree these days than it did in the past.

Specialist Goldfish societies, putting their best minds together, have come up with an agreed set known as *The Nationwide Goldfish Standards of Great Britain*. Although these are not yet carved on tablets of stone, they are seen as a basis for the future.

The Federation of British Aquatic Societies (FBAS) still retains its own standards which, I think, were revised in 1988, while the Association of Aquarists who, unlike the others, award points for presentation, are currently working on theirs. I am told these will be ready for the 1994 show season.

So, whichever shows you attend, it pays to know which rules apply.

Shows

There are, basically, two types of show:

1 Mixed shows

These cater for all sorts of fish species, mostly tropical, and normally have two classes for Goldfish. One of these is for all the single-tailed varieties, and the other for the double tails.

Despite murrerings from the Goldfish lobby, this seems unlikely to change. At

these shows, where you supply your own tanks and water, you can normally enter your fish on the day, so if you are exhibiting several fish, it helps to have a big strong car and a big strong wife or husband.

2 Goldfish-only Shows

The other type of show is a Goldfish-only affair. At these gatherings, fish are 'classed' according to variety. Here we find 'serious Goldfish', owned, and often bred, by men and women committed to the cause.

All tanks are prepared, numbered and filled with water in advance. Also, a show catalogue is usually produced. All this means that entries have to close some time before the show date.

There's no magic formula involved when choosing fish for the show bench. Armed with a mental picture of what a particular variety *should* look like, apply this to the fish you see before you. After that, it's a question of experience.

Choosing broodstock

Selecting fish for breeding stock needs a somewhat different approach. Here, 'pedigree' is a major factor. A good show fish will not necessarily produce good-quality offspring. Unless a fish has a known parentage from a well managed strain, the results could be surprising, and totally worthless.

The best place to obtain breeding stock from is, of course, a breeder. He or she will not sell you the very best fish (of course) but might offer you some very worthwhile 'second bests'. These fish may win no prizes, but should be fully capable of producing fish that will.

As a general rule, a moderate fish from a high-quality batch is worth far more than the odd good fish from an otherwise poor batch.

Don't choose a fish whose strength or stamina is suspect. Weak fish, if they spawn at all, tend to produce weak progeny. It is difficult enough trying to raise superior fish without adding to your problems. As one well known breeder keeps saying, "It's all in the genes, kid".

There are at least three ways to track down breeders. One is to scan the advertising pages of magazines such as *A&P*. Another is to go to the Goldfish shows which are usually announced in our magazine. Or join one of the Goldfish societies. There are a few in England and Scotland, but I don't know of any in Wales and Northern Ireland.

Of course, you don't need to breed or show Goldfish to enjoy them. A good sized furnished tank, containing one or more varieties of these superb creatures, can be most impressive and very satisfying. At least, I think so, but then, I like Goldfish ... so I might be just a little bit biased!



Judging is carried out according to the standards and methods of the society or organisation in question. In this case, Ranchu are being jointly assessed by members of a UK group which specialises in this variety, using methods inherited from Japan.

COLDWATER

JOTTINGS

BY
STEPHEN J. SMITH



Alan's Comet success

I was delighted to hear from **Alan Ratcliffe**, of Burnley, Lancashire, with news of his success at breeding and showing Comets.

Alan has been interested in keeping and breeding Goldfish for over 40 years, and is Show Secretary of Northern Goldfish and Pondkeepers Society, of which he has been a member for almost 20 years.

Alan writes: "My main varieties are single-tailed Goldfish and, for the last 15 years, I have been trying to create a good strain of Comets. After a number of false starts, due to having to rely upon imported stock to start the strain,

I am now in my third generation.

"At last year's NGPS Open Show, my home-bred fish came second in a class of 17 Comets, so I must be on the right lines.

"However," he added, "I must admit to a lot of failures, being unable to produce, from reasonably good parents, fish which even come close to the Comet Standards."

Alan's circumstances are not unusual, but he has overcome one of the biggest obstacles facing the hobbyist who tries breeding fish for the first time: that of the need to persevere. Among the golden rules of breeding Goldfish is that things take time.

For example, I have been working on developing a strain of

Blue Orandas for well over ten years now, with some mixed success. Although the strain I have is nowhere near showbench Standards (the Blue Oranda, in common with the Chocolate Oranda and the Redcap, are commonly a Fantailed variety, and thereby, quite literally, 'hangs a tale'), I am getting there and the effort has been well worthwhile.

So, if you have been trying, or you are thinking of trying, to breed your own Goldfish, do keep at it. The enjoyment far outweighs the disappointments; your efforts will also be of value to the rest of the hobby. And don't forget to let me know how you are getting on ...

SOAPBOX Untapped talent

I was delighted to hear **Dr Herbert Axelrod's** remarks at the FBAS's Supreme Festival of Fishkeeping. Dr Axelrod boldly suggested that the trade could learn a great deal from the hobbyist, and I wholeheartedly agree with his sentiments.

Hobbyists throughout the world possess a wealth of solid practical experience which could prove valuable to the trade and the hobby as a whole. A few of these aquarists are given the opportunity to pass on their experiences by means of talks at local and national shows and, of course, at international events like **Aquarama** in Singapore, and through organisations such as the various clubs, federations, associations and specialist societies.

But, I believe that a real depth of talent still lies somewhat hidden behind hobbyists' aquariums and fish-houses worldwide, in people who may never have realised that they do have a platform for their views and experiences.

So, make this a belated resolution for 1994: come out of the fish-room from time to time and share your knowledge. Join a society or two and talk to fellow members. If you're not shy, give a talk. If you are shy, give a talk anyway (you will be among friends, after all).

Or write to organisations and societies about your triumphs (and failures). Further, I'm sure, the editor of this fine publication would be delighted to welcome your letters and comments; he may even persuade you to write an article or two.

[You bet I would! Ed.]

Among your knowledge could, perhaps, be that missing piece from the jigsaw puzzle of the world of aquarology, which has always eluded us ... and you probably don't even know you are hiding it!

Oh, and lest we forget, you could even write to **Coldwater Jottings!**



AQUARIAN FISH FOODS

A small shoal of 'commercial-grade' Comets. It's not difficult to spawn this variety. Producing show-winning specimens is a different matter altogether.

Be prepared

As the last of the worst of the winter weather subsides, preparations for the new coldwater season begin in earnest. If you haven't already done so, there are one or two tasks which need doing NOW!

If you have a garden pond, you will find that a quick scrub-round will pay dividends for the health of your fish and your enjoyment of them over the coming season. It needn't take long.

Transfer some of your existing pond water into an old bath, or even a child's paddling pool, and use this to house your pond fish while you remove all of the remaining water (it is a good idea to cover the temporary quarters with boards and/or netting).

Prune all dead leaves and stalks from water plants and report them, placing the pruned and repotted plants into the temporary quarters with the fish.

Now to remove that awful 'sludge' from the bottom of the pond. You may be surprised at what you will find within it... and with its awful smell, you will immediately be assured that it was worth the effort. The sludge also makes good fertiliser, so mulch it onto your beds and borders, or mix it into the compost heap.

A good scrub-round with a stiff brush and clean water (never,



PHOTO-JOTTING

Three good-quality Jikins.

These remarkable Fancy Goldfish are Jikin (pronounced Jee-kin). Developed initially by the Japanese, the Jikin is possibly the most fancy of the 'Primary' group of Goldfish — ie; those with long bodies, as opposed to round-bodied Fancy varieties, such as the Oranda and Moor.

The T-shaped (from above) double caudal fins are a major characteristic of the Jikin and, ideally, colouring should be all-over white or pale pink, with just the fins and the line of the lips an orange-red.

However, perfectly-coloured specimens are rare, even from the same brood, so don't be disappointed if the majority of fish are a mixture of red-and-white.

ever, use cleaning preparations) will remove the last traces of stubborn algae. Then it's time to refill the pond with water from the hose. Leave it to stand for at least 24 hours (alternatively or in addition — add a dechlorinator and/or water conditioner) and place the plants and fish into their 'spring-cleaned' quarters.

Did You Know ...?

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

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

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

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

Anti-tabloid resolution

Having read the *Daily Mail* masterpiece (see Soap Box last month), here's a belated New Year resolution! How about making sure, without boring the pants off everyone, that every person you know who is not familiar with this pleasurable pursuit of fishkeeping, pretty soon does?

And how about ensuring that those who are simply unaware that there is more to the Goldfish than a fairground runt, very soon come to appreciate the variety and beauty provided by the Moor, Lionhead, Oranda, Ryukin, Veltail ... and so on?

The hobby will be the better for it. And at least we might, possibly, stand some chance of the tabloids getting it right!



NORTH LONDON'S FINEST AQUARIUM



FISH RANGE	*	*	*	Marine, tropical, coldwater & inverts
PRICES	*	*	*	Competitive plus SPECIAL DISCOUNTS for
QUALITY	*	*	*	AQUARIST & PONDKEEPER readers
ACCESSORIES	*	*	*	The VERY BEST
ADVICE	*	*	*	A complete range to satisfy the specialist
				and novice
				By our experts (and given free of charge)

DISCOUNT VOUCHER

20% MARINE FISH

OFF Name

Address

With this

voucher

DISCOUNT VOUCHER

10% AQUARIUM

OFF Name

Address

With this

voucher

PETWORLD Cricklewood, Units 1 and 3,
Broadway Retail Park, Cricklewood Lane,
London NW2. (Food Giant car park)

TEL. (081) 450 3030

Types of Fish Show

- 1 Table Shows** — staged by clubs for members only. These usually take place on a weekday evening and are the best type of show for beginners to start with.
- 2 Open Shows** — staged by clubs but open to non-members. These usually take place on a Sunday and entries can number up to 1000.
- 3 Tableau Shows** — staged at the 'National Exhibitions' in which the fish are shown in tanks within a box-like structure. These boxes are exhibited by a club so a number of exhibitors' fish are contained within the structure.
- 4 Specialist Shows** — staged by specialist societies and usually reserved for one type of fish (eg) Goldfish, or a 'group' (eg) Livebearers.



If you are taking a lot of entries to a show, the amount of equipment soon mounts up!

SHOWTIME!

PART 2

EXHIBITING WINNERS

More expert tips for show fans from top winner **Derek Lambert**

Photographs — unless otherwise indicated — by the author

In my previous article I gave my tips for producing show fish and preparing them for the show bench. This month, I shall be dealing with the practical aspects of exhibiting fish and the different types of show that take place in the UK.

Show types

There are various types of fish shows held in this country and many organisations which draw up rules and appoint judges for them.

1 Table Shows

The smallest shows are the Table Shows organised by local clubs and usually staged during a weekday evening. This sort of show is ideal to start with, because your clubmates will be able to give you some pointers on what you are doing wrong. You will also have a chance to try out your potential show fish before taking them to a full-blown Open Show.

Unfortunately, local clubs have been in a decline in recent years and fewer Table Shows are held now.

2 Open Shows

This is the commonest type of show by far. As their name implies, these shows are open to all exhibitors, whether members of the host club or not, and it is at these that the competition is toughest.

Depending on the area and how well the show is organised, entries can reach 1,000 fish and competitors may travel over 100 miles to be there.

3 Tableau Shows

Tableau Shows are held at 'Festivals', such as the British Aquarist Festival, Yorkshire Aquarist Festival and the Scottish Aquarist Festival.

Because these are held over a period of several days, the entries are shown in tanks within an overall structure called a tableau. This is usually made to look like something else (e.g. a filter or dragon). The tank temperatures can then be better controlled and aeration and filtration can be installed for those fish which need it.

4 Specialist Shows

These are organised by several specialist societies and usually involve pairs of fish which may, or may not, be sold off after the show.

Normally, the various classes have more sub-divisions than at other shows.

Show equipment

If you have not shown fish before, the following tips may prove useful.

Selecting the correct show tank is very important, primarily for the wellbeing of the fish, but also for your success in the show. The tank must be large enough to accommodate the exhibit for the duration

of the event and be of neat and clean appearance.

The bottom may be clear or painted black on the outside. Some shows allow gravel in the tank, but not all. Special show tanks can be purchased which have been almost invisibly sealed and have a black bottom. These show the exhibit off to its best advantage and are well worth the money.

The next most important item after the show tank is the water. This must be clear and as free from floating particles such as plant, food and fish waste, as possible (technically, a small piece of plant left in the tank can be grounds for disqualification). It must also be of the correct temperature, pH and hardness.

Many exhibitors use the fish's own tank water, or fresh water which has been allowed to stand a few days for the escape of gases and equalisation of temperature to that of the fish room. Never use water available at the show as this may be different to yours and harm your fish.

Transportation

The journey to the show can be a traumatic time for both the exhibitor and exhibit alike. Calm species can be taken to the show in the tank, but scatty species, such as some of the riverine fish, should be transported in their own polythene bag.

This should be placed in a couple of dustbin liners to keep the fish as dark as possible, so that they remain placid. I used to show several large barbs in this way and the fish arrived at the show undamaged.

Great care needs to be taken when the fish are transferred from their bag to the show tank. This operation has led to some of the funniest incidents you can imagine. One exhibitor who opened a polythene bag a little uncautiously, had a Snakehead fly past his left ear on its way to landing in someone's dinner! The show was being held in a work's canteen.

Whether in the show tank or a polythene bag, the fish should be taken to the show in a polystyrene box to keep them warm. Some exhibitors line wooden carrying boxes with polystyrene and place the tanks in this. Either way works, but remember, even with this insulation, extremes of temperature must be avoided.

Never leave fish in a car on a sunny day. The temperature shoots up at a phenomenal rate and can soon reach a critical level. Never put fish in the boot of the car if it can be avoided, either. The boot can become very cold in bad weather and, on a long journey, the fish may suffer.

In this modern day and age, when most exhibitors have cars, all you have to do is load up, hop in and drive to the show. This, however, was not always the case.

I started my fish showing life using public transport. Living on the outskirts of London things were not too bad. I had the underground system within easy reach and quite a number of shows could be reached this way. To transport the heavy load we



A tableau entered at the Yorkshire Aquarist Festival. The fish tanks are contained within the loadstools!



Entering a Tableau Show is hard work. Setting up may take several evenings, and building the tableau can take many months.



My mother, Pat and I with (in the centre) A&P editor John Dawes who donated the crystal trophy we won at YAF '93 for our Goodeid (Livebearers) entry at that show.

used a shopping bag on wheels. My mother (Pat) and I knew the stations not by which lines they were on, but by how many stairs we would have to walk up carrying the bag on wheels!

Today, it is almost unheard of for anyone to show fish in this way, but I know of one couple (a mother and son team again) who do. Doreen and Geoff Brown can often be seen around the northern shows having taken a combination of buses, trains and taxis to reach the venue.

Show day

On the day of the show, the fish will need to be caught and placed in their tanks. These are then sealed with cling film and the lid put on. Those fish in bags must be placed in a separate polystyrene box to the tanks or the sharp corners may puncture them (the bags, not the fish!).

Once at the show, each entry will be given a number and this, together with a label stating the scientific name of the fish, should be stuck on the tank in a prominent place. The sides of the tank should be cleaned with a kitchen towel and any fish wastes produced on the way to the show removed from the tank with the fine-meshed net. The tank water can be topped up with the spare water if some has been lost during the journey.

After benching, all you have to do is wait for the results. At most northern shows, an auction is held — usually during judging — where many bargains can be purchased. Southern shows often lack this distraction, so many exhibitors adjourn to the local hostelry and only return to the show hall in time for the results.

The winners are generally happy with the judging (for once), while the losers think the judges need glasses ... at the very least! Very occasionally, you will come across an exhibitor who understands that the judge's job is very difficult and he/she is only expressing an opinion, which is what you asked them to do by entering your fish in the show. If you do have a query about the judging, ask politely and listen to the reply.

At the end of the show you will need to seal up the tanks with cling film, or catch the fish out into polythene bags again and pack them away. Then comes prize giving. This is where you will, hopefully, need the large carrier bag to put all your prizes in!

Vote of thanks

I would like to take this opportunity to thank everyone in Kingston and District Aquarist Society who helped us in the early days of our fishkeeping and showing.

Our special thanks go to Mac, who spent ages trying to revive a Kuhl Loach of ours which had a heart attack while at a club show. It is only one of about three fish we have lost at a show, but to a young lad at one of his first shows, it was a terrible disaster which nearly put me off showing fish.

QUESTION TIME

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

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

TROPICAL



Top ten tropics

I would like to set up a fresh-water tropical community aquarium. What fish should I choose?

There are numerous fish suitable for the home aquarium, so it is impossible to list them all, except in a manual of fishkeeping. The following are the top ten most popular tropicals:

Neon Tetra (*Paracheirodon innesi*), Cardinal Tetra (*Paracheirodon axelrodi*), Angelfish (*Pterophyllum scalare* - note that older Angels can turn nasty, but remain very popular — sometimes the top seller), Guppy (*Poecilia reticulata*), Molly (*Poecilia spp.* — but note that the Black Molly is really a brackish water fish; you may have problems with this fish eventually), Platy (*Xiphophorus maculatus*), Swordtail (*Xiphophorus helleri*), Zebra



Community fish are so-named because they are (generally) compatible.

Danio (*Brachydanio rerio*), Dwarf Gourami (*Colsa lala*), Cory Catfish (*Corydoras spp.*) Most aquatic shops list suitable fish as 'community' fishes, which, by definition, means they are compatible. Some good stores use a traffic light system, with a red dot on the display for fish that are dangerous or require special conditions, amber dot for fish where special knowledge is needed before buying, or a green dot for easy-to-keep, compatible species.

Pop-eye causes

What causes Pop-eye in aquarium fish?

Exophthalmus or Pop-eye is quite common in fish and is a symptom of many diseases. The most common is poor water quality, i.e. ammonia and nitrite build-up. This stresses the fish and has the effect of reducing its ability to excrete the water it absorbs. The first effect is therefore eye swelling (Pop-eye) and then body-swelling (Dropsy).

Postmortem examination of such fish will show clear water within the eye (or the body cavity).

Tuberculosis can develop behind the eye and this gives the next most common cause of Pop-eye.

Gas embolism certainly produces the same effect, but this is rare in aquarium fish. It is more a problem of farmed edible fish.

Some species also appear to be more prone to this type of problem. For example, any owner of Oscars will confirm that their eyes are always prone to swelling unless the water is always at zero ammonia level ... which is difficult with such a greedy, messy feeder.

PLANTS



The White Marsh Marigold.

White Marsh Marigolds

I am very attached to my Marsh Marigolds which give a splendid golden display by my pool every spring. I believe there is a white variety of this plant, but have never seen it. I therefore wondered if you would publish a photograph of it.

Only too happy to oblige! *Caltha palustris alba* is treated exactly the same as the other varieties. It should be widely available as from now, and will begin flowering almost straight-away, if the plant you buy is substantial enough.

Variable Crypts

I am having great difficulty in identifying my *Cryptocorynes*. As far as I know, they are all from Sri Lanka, but none of them exactly conform to the photographs I have seen in books. Why is this?

Sri Lankan *Cryptocorynes* such as *C. wendtii* and *C. petchii* vary enormously in appearance, even in the wild, depending on where they are collected. There are also numer-

ous subspecies which vary slightly from the type.

In addition, depending on whether they are growing emersed or submersed, in sun or in shade, their actual colour and leaf shape will show great variation.

In aquaria, too, they will adopt different growing forms. An additional complication is that because many species are grown close together in plant farms, hybrids have arisen which have some of the characteristics of both parents.



Cryptocoryne wendtii growing under aquarium conditions. After these conditions, and you'll also alter the appearance of the plant.

KOI

Fluke symptoms

Recently, two of our young Koi, both approximately 1½ years old, died in our pond. Up until this time they had been doing very well.

We found the first to be hanging around the filter outlet. It was not at all alert and you could even have touched him. We noticed that it had a few Fish Lice on the tail and fins. That evening, it died. The very next morning, a similar thing was happening to another of the members of our pond, also with the same end result.

We should perhaps mention that the evening before the occurrence, we had put in some *Daphnia*, having first soaked them in Pure Pond to disinfect them. Although we noticed that this killed quite a lot of the *Daphnia*, we still tipped the bucket into the pond. We are now wondering if these two fish could have ingested too much of the treatment, i.e. by eating dead *Daphnia*, although we understood it was quite safe to put this product into the pond.

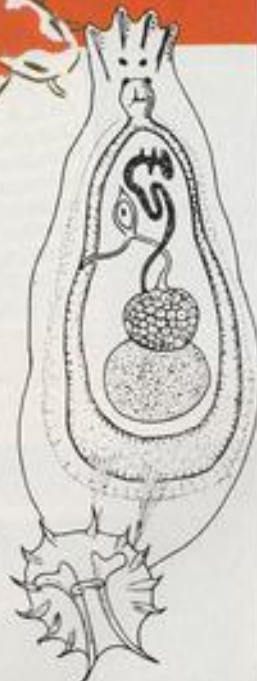
Although it is always difficult to diagnose at a distance, I feel fairly confident that the problem your Koi were suffering from was either Gill Fluke or Gill Rot, as the symptoms you describe are classic for both these diseases.

The former illness is caused by parasitic infection and the latter usually by poor water quality, i.e. excessive ammonia etc.

Gill Flukes can be successfully treated by one of the commercially available remedies, provided the infestation has not caused irreparable damage. Gill Rot is more serious and treatment is not usually successful. Water changes can help, in addition to salt dips, while dips with something like Roccal will reduce the inflammation which occurs, but the most important aspect is to ensure the water quality is correct.

I'm most concerned to read that your Koi have a population of Fish Lice, as this is not indicative of good husbandry. Although these animals are usually little more than an irritant to fish, their presence can lead to secondary infection through the sites of bites, so I strongly urge you to rid your pool of these creatures, again using a proprietary remedy such as Starazin P (only if you have no Orfe in the pool).

I would also advise caution in introducing live *Daphnia* into the pool, in spite of your precautions, as they can carry all kinds of nasty things. Unless you are



Dactylogyrus — the Gill Fluke. Heavy infestation can cause death.

rearing fry, *Daphnia* are not much use as a Koi food anyway, being so small.

Alternative foods

1 Are live foods in the shape of worms etc. good for Koi?

Worms (if you can bear to eat them up) are a very good food for Koi, as are wasp grubs, caterpillars etc; all are snapped up very quickly. Some enthusiasts use maggots like those used by anglers, but these should be used sparingly, as they contain a large amount of ammonia.

2 Is frozen food, as used in aquaria, suitable for Koi?

For feeding Koi fry up to perhaps 2 inches, frozen food does have its uses, but if the fish are any larger, this type of food will become uneconomical.

3 What foods, other than the commercially available ones, could I offer my fish?

Koi are omnivorous and will therefore eat just about anything which comes their way. Boiled potato, lettuce, prawns, cockles, dried dog food, raw fish broken up, and so on. Any of these could be used, but just as occasional treats. Anything containing sugar is, however, a definite no-no.

COLDWATER

Formal v informal

We only have the space for a small pond in our garden and we are just a little confused as to the terms "Formal and Informal" designs. Can you explain the difference?

Informal ponds may be described as more natural creations, with natural outlines and curves, avoiding straight lines, while the formal designs may be square, rectangular, circular or oval in shape.

The informal ponds tend to blend in with the whole garden concept; the formal, I think, becomes a feature in itself.



Formal ponds are symmetrical in design, in this case, square.



aquaria, and unless the quality of the water is good, the fish cannot survive, let alone thrive.

There are no secret methods to maintaining the best conditions for the fish, other than keeping to the rules which are: Never overstock, feed a good balanced diet, never introduce newly acquired fish into your tank without first keeping them in quarantine, and keep up regular tank maintenance with frequent, partial water changes.

Allow 1 inch of fish per 30 square inches of surface area. This will allow your fish to live their lives with room to grow and develop. I therefore suggest that a second aquarium would be wise in your case. Separate your present stock, leaving one of your tanks for tropical varieties; while the other houses the Goldfish. I am sure you would then enjoy the best of both worlds.

Koi and Orfe are only suitable for the aquarium when they are very small. These fish grow quickly and large and are therefore only really suitable for ponds.

Success no secret

I keep a variety of fancy Goldfish, a few small Koi and Orfe, and a small selection of tropicals in my aquarium.

However, I'm always encountering problems. What are the secrets of success that you could pass on and which will allow me to overcome my present difficulties?

Let me begin with the question of stocking, regarding both the number and type of fish you have. In my opinion, it is not a good idea to mix tropical fish with those temperate types such as the Goldfish and its varieties. Many tropical species are only able to live if the water chemistry is suitable for their particular needs. The temperature is also important; most are unable to survive below a certain temperature, while Goldfish suffer in many ways if the water temperature is too high for long periods. Therefore the needs of all these fish are different and quite separate and should be kept so.

Although you did not give me the sizes of your fish I am certain that your set-up must be very overcrowded.

In crowded conditions fish suffer stress just as we would if we had to endure similar conditions. Stress causes ill health, and, consequently, outbreaks of diseases are common. It is also very difficult to have control over water quality in overstocked

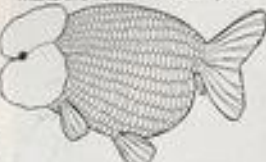
Top lionheads

I have been keeping Fancy Goldfish for a couple of years and though I have seen many pictures of the Lionhead, I have not been able to find any for sale.

My intention is to purchase a few youngsters to grow on and, hopefully, enter them in the future at one of the Goldfish shows. What should I be looking for when selecting these fish?

Show Standard Lionheads are like rare and precious jewels, for even in the very best breeding lines, there will be few youngsters in any one spawning which will be good enough to be of Show Standard Quality.

Even if a young fish has the ideal body and finnage shape, you must wait patiently to see if the hood develops sufficiently to make the fish a real champion.



'Perfect' Fish are so difficult to produce, that Standards books usually rely on drawings to highlight the features that top judges would be looking for.

HERPETOLOGY

Snake books

Can you suggest some informative books about keeping and breeding snakes in captivity? I am particularly interested in Kingsnakes and Milk Snakes — the genus *Lampropeltis*.

1 I can recommend the following three books which provide a wide range of practical information about maintaining and breeding snakes in captivity: *Kingsnakes and Milk Snakes* by Ronald G Markel. This book covers every species and subspecies of *Lampropeltis* in full colour. There are 200 high-quality photographs which show different

Two excellent books for snake lovers.

JULIAN SIMS

aspects of these reptiles, including body coloration, food and parasites. There are also a number of original colour paintings by John R Quinn which depict head and mid-body views of each subspecies. This is the first time that all valid subspecies of *Lampropeltis* have been

illustrated in colour, especially the Milk Snakes.

Published by THF in 1990 at a cost of £20.95, this hardback book is 144 pages in length and an absolute must for anyone interested in reptiles, especially the Kingsnakes and Milk Snakes. ISBN: 0-86622-664-8

2 *A-Z of Snake-Keeping* by Chris Mattison. Containing 144 pages, this book is well illustrated with colour and black and white photographs taken by the author. This book was first published by Merehurst in 1991 at an original cost of £14.99. However, it has recently appeared in 'remainder' and 'discount' bookshops at a bargain price of around

3 *Keeping and Breeding Snakes* by Chris Mattison. This book is 184 pages in length and was first published by Blandford in 1988 at a price of £18.95 (hardback). ISBN: 0-7137-1865-X. It is now available as a paperback edition at the very reasonable price of £9.99.



Dropping plumes and shrinking anemones

Suddenly the plumes of my Feather Dusters are dropping off and my anemones are shrinking. All the usual tests are fine. What is happening?

Oh dear, I don't like the sound of this. Don't panic, however, but first eliminate the possibility of your test kits being inaccurate. Liquid reagents have a very short life and if yours are such a type and are quite old, you are not getting accurate readings. Buy new ones.

If that isn't the problem, then there is some external factor which is poisoning the aquarium. This could be something like

aerosols being used around the aquarium, smoking nearby, or a leakage of heavy metal into the water. Check that everything you use is suitable for seawater.

In the short term, do lots of water changes and filter heavily through activated charcoal. You have your work cut out. Good luck!

Spitting Puffer

Why does my Puffer spit water at me whenever I clean the tank? Is it trying to help (?) with the water change, or is it asking for food?

I have to confess that I don't know. Furthermore, I have scoured my not inconsiderable library for anything on Tetraodonidae (Puffers) and there is no

mention of the phenomenon to be seen.

However, if pushed, then I would have to take a stab and say that I would guess that the spitting is connected to the mechanism for taking in and expelling that puffers

possess in order for them to evade being something else's dinner.

In any event, it is yet another of those wonderful, unexplained things that make this hobby so fascinating.



Puffers (this is the Scribbled Puffer — *Arothron mappal*) can blow themselves up with water ... but spit?

THE MAGIC SOLUTION FOR BETTER FISH KEEPING

All fish pollute water just by living in it

Safe-water — Controls pollution

Safe-water clears cloudy water, quickly removes the effects of urine and ammonia. Safe-water makes the life of your fish more comfortable — it really works!

King British Fish foods & Water treatments

"The perfect combination for those who just want to do it better"
On sale at Aquatic shops, Pet stores and Garden centres





SPOTLIGHT

Something over a decade ago, I had the pleasure of attending a lecture on Central American cichlids by Dr Paul Loiselle, the well known American ichthyologist and cichlidophile. Paul is noted for a somewhat extravagant sense of humour, but even so, his comment that the Convict Cichlid (*Archocentrus nigrofasciatus*) can be kept in a Coca-Cola bottle on your desk is not far off the mark; for this is one of the most hardy and adaptable of cichlids, something which undoubtedly accounts for its success, both in the wild and as an aquarium fish.

Its bold markings are very attractive, it is virtually indestructible (I don't think I have ever heard of anyone managing to kill one by poor management!), and easy to breed. Its cooperative nature as regards this last point has earned it a high degree of popularity as a laboratory animal for behavioural research. Its manners may leave something to be desired, but then it is a cichlid, after all ...

Name 'evolution'

The Convict first became known to science in the latter half of the last century, and was originally described by Dr Günther in 1869, under the name *Heros nigrofasciatus*. The specific name was well-chosen, as it means black-banded — applicable to many cichlids, but in particular to this species. Some years later, *Heros* was synonymised with *Cichlasoma*, and the Convict became *Cichlasoma nigrofasciatum*, the Latin name under which it is still known to most hobbyists, some of whom are undoubtedly wondering why it now appears here as *Archocentrus*. A few

words of explanation will therefore not come amiss.

As many Central American enthusiasts are already aware, in 1983 Dr Sven Kullander, a Swedish ichthyologist, restricted the *Cichlasoma* genus to its South American representatives, including (naturally) the type species, *C. bimaculatum*.

This step was long overdue; scientists had long realised that *Cichlasoma* contained several different lineages, but the work involved in splitting them up into separate genera was such that everyone had been avoiding the issue. As long ago as 1905, Dr C.T. Regan had divided the genus into a number of "Sections" or subgenera. Kullander boldly took the first step, but this threw the rest of the genus into 'taxonomic limbo', as at the same time, he restricted the only alternative generic name for ALL the others, *Heros*, to just *H. severus*, the Severum.

Under the rules of taxonomy, Kullander could have declared that Regan's subgenera were now full genera, but he declined to do so, in order to avoid impinging on research by other scientists already in progress. So, for 10 years, almost everyone used "*Cichlasoma*" for the Central American species, in deference to Kullander's sensible suggestion.

Then, in 1992, an article appeared in an American hobby magazine in which it was stated that *Herichthys* (one of Regan's sections, but also previously a generic name) was available for use for all the "dispossessed" Central American species.

This is probably strictly correct, under the rules of nomenclature, BUT there are powerful arguments against the usage. Firstly, while both *Cichlasoma* and *Heros*

have, at various times, been used for all cichlasomines then known, *Herichthys* has not; many species were assigned to their own genera (some also subsequently "Sections") when it was in use.

Secondly, and far more important, it is quite clear that the arrangement would be only temporary and that at some future date, most species would have to be moved yet again. So a number of authorities, including the Dutch cichlid expert Ad Konings, decided that if one old generic name was going to be resurrected, then they all should be. So the Convict and its close relatives (eg *topica*, *spilargis*, *spinosissimus*, *septemfasciatus*) now belong to *Archocentrus*.

The common name, of course, refers to the resemblance to the distinctive striped suits once worn by prisoners — and not to the species' sometimes 'criminal' behaviour!

Dual nature

In nature, the Convict is found throughout a large part of southern Central America, extending from Guatemala south to western Panama, and from the Atlantic to the Pacific coast.

Within this range, it is found in two quite different types of habitat — lakes (including those of Nicaragua) and permanent water-courses (ie those that don't dry up outside the rainy season). We do not know which biotype our aquarium population derives from, but almost all bodies of water within the Convict's natural range are moderately hard and alkaline, and these conditions should be reproduced in the aquarium.



A. DAVIS, TFM

The Convict Cichlid

Very little is known about the fluvial (river) populations (underwater research is difficult in shallow streams!) except that they prefer slow-moving areas of water, eg backwaters, and pools formed where the river widens in its course.

Lake Convicts

Luckily, however, the lacustrine (lake) population of Lake Jilón (a crater lake in Nicaragua, adjacent to the much larger Lake Managua) has been studied during underwater research on all the cichlids of that lake (McKaye 1977).

Apparently, Convicts are found mainly at relatively shallow depths, probably as a safeguard against predation by larger cichlids which are found in deeper water. A further deep-water predator is the Elcotrid (Sleeper Goby) *Gobiomorus dormitor*. The habitat is shared with large numbers of other small cichlids, mainly *Neotrophus serratopus*.

The small cichlids live in close association with the shoreline, where they find shelter and breeding sites among stones and rubble, in the case of Convicts, often digging their own hole, instead of using a pre-existing one. The large predatory species are not tolerated in these littoral areas, but are 'mobbed' by crowds of Convicts and *Neotrophus* in much the same way that a hawk is attacked by passerines. Algae growing on the substrate in the shallower areas form an important part of the diet, and this, as well as safety, is undoubtedly a factor in habitat preference.

The relationships between the cichlid species in the lake are very complex, with two factors particularly important —

Tough, boldly marked, easy-to-breed, indestructible, adaptable ... What more could any cichlid lover want from a fish? **Mary Bailey** focuses on these and some other qualities possessed by this prolific central American species.

interspecific predation and competition for breeding sites. Briefly, (McKaye's paper — see bibliography — is highly recommended for anyone wanting the full picture), adult Convicts are major predators on *Nandopsis dovii* fry; adult *N. dovii* are the main control on the size of the adult Convict population; and juvenile *N. dovii* predate heavily on Convict fry (as do other Convicts, Midas Cichlids (*Archocentrus citrinellus*) and adult *Neotrophus*). Similar relationships exist between the other cichlid species of the lake.

Two-phase breeding

The breeding seasons of the various species tend to have a minimal overlap where there is competition for breeding sites (ie Convicts and *Neotrophus* have different breeding seasons), undoubtedly because there simply isn't enough breeding territory to go round. The peak of Convict breeding is in April, with a second, lesser, peak in August — both during the dry season.

CONVICT FACT FILE

Common Name: Convict Cichlid
Scientific Name: *Archocentrus nigrofasciatus*
Distribution: Central America — Guatemala to western Panama
Habitat: Lakes, backwaters and pools in permanent streams. Fairly shallow water with cover.
Size: In nature, males 3.5in (8.75cm) SL*; in captivity, much larger sizes may be attained: 4.7-6in (12-15cm) in males. In both cases, females are relatively smaller.
Diet: Opportunistic omnivore (including vegetable matter)
Water Requirements: Moderately hard and alkaline. Temperature 24-25.5°C (75-78°F)

*SL = Standard Length — i.e. the measurement from the snout to the caudal peduncle (base of the tail fin).

Breeding is largely synchronous within the species as, from the viewpoint of the parents, fry are more likely to survive if a predator has a huge choice of victims — the safety in numbers system. It is thought

that the timing has evolved to coincide with the period when Midas Cichlids (*Amphilophus citrinellus*) are too busy tending their own eggs to go hunting Convict fry; the algae supply may also be a factor in bringing the small cichlids into breeding condition at these times.

A pair of wild Convicts occupies a territory about a metre in diameter, but a territory is sought out only after pairing has taken place. Competition is intense, and it is thought that, at most, 1 in 10 pairs manages to hold a territory long enough to rear a brood. For this reason, territorial aggression is directed mainly at conspecifics (members of the same species) during the pre-spawning and egg-wiggler-tending phases. Later, potential predators, rather than competitors, are the main enemies, perhaps because the fry are now mobile and will, with their parents, be tending to forage over a larger area.

This, however, renders them more liable to predation. But this type of population control is necessary — particularly in a closed environment with restricted living space — and prevents Lake Jiloa from being taken over by Convicts. One of the experiments conducted by McKaye and his colleagues was to provide additional cichlid territories by creating an artificial 'rocky zone' in an otherwise cover-free sandy area — using old tyres! It was colonised almost immediately by several cichlid species, including, of course, the Convict.

Average clutch size is about 75 eggs, which are laid in the safety of a hole among the stones. As in captivity, most of the egg-tending is performed by the female, while the male defends the territory against take-over bids. If the fry reach the free-swimming stage, then both parents guard them for about 7 weeks, much longer than many other cichlasomine substrate-spawners, again undoubtedly reflecting the dangerous environment. Even so, it is estimated that only 15-20% of fry survive.

Captive Convicts

Considering its natural environment, is it any surprise that the captive Convict has a reputation for being a little scrapper, territorial out of proportion to its size, and prolific as the proverbial rabbit? Without these qualities it would soon become extinct in the wild, something the aquarist should bear in mind as (s)he wonders what on earth to do with the umpteenth brood of fry ...

I personally think there is reason to believe the Convict's behaviour has been beneficial to what I will term 'integrity of type' in captivity. Admittedly, aquarium specimens grow far larger than their wild cousins, undoubtedly because there is a better and more regular food supply and less competition for it, but they are still splendidly coloured, rarely deformed, and show little signs of losing their natural belligerence. (Contrast the Blue Acara, *Aequidens pulcher*.)



The Midas Cichlid. Convicts spawn at the same time as this species in the wild, as a result of which the brooding Midas are probably too concerned guarding their young to prey on Convict fry.

The reasons should be obvious: it is very rare for anyone to deliberately set about breeding Convicts in a specially designed set-up where they are 'coddled'. Instead the majority of Convict fry start life in the corner of a community aquarium ... often, a very small corner of a community of larger cichlids.

They are culled vigorously by their tankmates, or failing that, by the aquarist, who is generally only too aware that even such a popular fish has a limited market. So, unlike many cichlids (and other fishes), survival of the fittest remains the order of the day.

Albinos?

Not surprisingly, given the sheer numbers kept and bred by hobbyists over a period of more than 50 years of captivity, the Convict, like several other popular cichlids, has produced a colour 'sport', the so-called 'Albino Convict'. In fact, none of the specimens I have seen has been a true albino, as the eyes have been pigmented.

True albinos lack pigmentation, the red of the eyes being simply the colour of the blood running through the tiny ocular veins. So these 'albinos' are probably a leucistic form instead — pigmented but with no 'active' chromatophores. In both hardiness and temperament they appear to be the equals of their striped cousins.

Cautionary tips

I am sure I do not need to tell you how to keep such an indestructible fish — though if you want to keep them properly, you will find plenty of clues in the details of their natural habitat given above. But a few words on preventing them from wreaking havoc on their tankmates may

not come amiss.

Nature has made them 'scrappers' in order to ensure their survival in a highly competitive environment. Removing them from that environment and placing them in a secure home with an easy lifestyle will never turn them into aquatic 'couch potatoes'. Their instinct is to compete (and to predate on smaller fishes), and they will do so. So they are NOT suitable occupants for a general community, whatever anyone may say. They will undoubtedly do very well there, but at the expense of their tankmates.

If housed with other small Central Americans (eg Firemouths, *Thorichthys maculatus*), they will do their best to carve out as large a territory as nature intended. The other cichlids will either be badly harassed, or, if they are of similar temperament, they will, in turn, be trying to grab as much space as they need.

For this reason, much thought should go into what and how many to house together in any given size of tank. Those aquarists who have visions of communities of small Central Americans are doomed to disappointment, as even with just two pairs in a 48in tank, a divider is often necessary when breeding occurs. I should also mention that competition is likely to be increased if the tankmates are other *Archocentrus* ...

In fact, Convicts often do very well in very large tanks with larger cichlids, where they are capable of holding a small territory in a pile of rocks in one corner, able to escape attack because their caves are too small to admit any aggressor. The male will often sally forth against an encroaching larger fish, which generally doesn't bother to argue the point. It is common, even normal, for broods to be hatched, and some fry reared, successfully in this type of set-up — and without any harm coming to tankmates.

Of course, if you are really keen, then an 8 x 2ft community of small Central Americans, with room for competition without continuous harassment, could be a lot of fun!

FURTHER READING

- Konings, A. (1989) *Cichlids from Central America*. TFH Publications Inc., Neptune, NJ, USA. 224pp. ISBN 0-86622-700-6.
 McKaye, K.R. (1977) Competition for Breeding Sites between the Cichlid Fishes of Lake Jiloa, Nicaragua. *Ecology*, 58: 291-302.
 Miller, R.R. (1966) Geographical Distribution of Central American freshwater fishes. *Copeia*: 773-802.

There is a British Cichlid Association information pamphlet on this species, price 50p from BCA(API), 7 Delamere Avenue, Sale, Cheshire.

KOI TALK



by
John
Cuvelier

Worrying trends

You must be aware by now that the months of January through April are more or less dead for your average Koi keeper... or are they?

Whatever the season, there's always something going on somewhere which is of interest to us Koi nuts! For instance, I was having a chat the other day with Charles Harris of 'Purity on Tap', that Guru of water conditioning units for Koi keepers, and he informs me that a worrying trend is appearing in some areas of the country.

Thanks to the closing down of many deep collieries, together with the switching off of pumping associated with these workings, high levels of various contaminants are now appearing in aquifers as water levels rise. Nasties such as iron, manganese, sulphides and various other unquantified horrors are likely to surface.

Peculiar events, such as the turning black of pre-filter cartridges, have been observed, and there is every sign of the problem worsening.

One of the most common indications so far reported is a great increase in pH levels, so watch out for the tell-tale signs.

I'm given to understand that development of a cartridge is

KOI DICTIONARY/Rein Fibres (Fibromix)

This material first came to the notice of pond builders about 10 years ago and has rapidly grown in popularity ever since.

Ponds constructed in concrete have always suffered from cracking due to the action of frost, soil movement etc. By its very nature, cement on its own is quite a weak material and needs to have sand added to increase its strength. This, of course, makes the resultant mix porous and prone to hairline cracking.

By reducing the amount of sand in the mix, and adding a carefully weighed amount of tiny plastic-like fibres, the strength of the mix is greatly increased and hairline cracking virtually eliminated.

If a pond is excavated in terrain of solid clay, it is perfectly feasible merely to trowel on a one-inch layer of cement over the whole excavation and end up with a completely waterproof and immensely strong pond. Ponds in more friable terrain should be constructed of blockwork, which is then merely skimmed with about half an inch of Fibromix to achieve the same result.

I am now on my fourth pond and can vouch for its effectiveness; provided the maker's instructions are followed religiously, there should be no problems at all.

A 2-to-1 sand/cement mix, plus fibres, should be used. This will result in a very highly alkaline finished pond and precautions must be taken to paint the pond with a proprietary paint before introducing fish.

A very interesting and informative leaflet, together with full instructions, can be obtained from: Rein Ltd, Clifton Hall, Ashbourne, Derbys, DE6 2GL. Tel: 0335 42265.



Superficially, a Fibromix-reinforced pool such as this one, looks no different to any other pool. Internally, it's quite another matter!

under way at P on T. If you're worried about this trend why not give Charles a bell on 0488 648319?

If you have not yet organised a de-chlorination unit for your Koi, then for goodness sake do it now!

Agony Aunt

I had a call recently from a very concerned lady Koi keeper in the process of updating her pond from its present unfiltered version into an all-singing, all-dancing, clean-as-a-new-pin pond.

After more than an hour of discussing her options, we finally got round to the subject of what pump she should use. Like the great majority of enthusiasts, her's was not a bottomless purse, so she was delighted

when I persuaded her to invest in one of those excellent Grundfos Selectric central heating circulators.

These are very cheap to purchase and run, and are infinitely reliable, provided they are housed in a dry situation. The three-speed function is useful also for use in winter, when a lower flow rate is helpful.

She did have reservations, however, about rusting of the pump body, having read something somewhere about this problem (quite a knowledgeable lady this!). I've never had this problem in all the years I've used these pumps but, no doubt, in some parts of the UK, there could be a problem with the quality of mains water used. I suggested that if she was worried, there was now a 'gismo' available which replaced the



My faithful, long-running Grundfos pumps are housed in a waterproof chamber.

impeller housing with a plastic alternative.

By this time, I was suffering from 'red-eye syndrome' and aching ear, so a reluctant halt was called in the conversation which was resumed on another day. I'll relate more of our marathon chat in the next edition, but it was a most enjoyable matter, and I cannot be certain who enjoyed it the most... or learned the most!

DID YOU KNOW?

Oxygen (O₂), is the most important 'dynamic' constituent of our atmosphere and without it, life as we know it would become extinct.

Quite apart from mundane matters like needing the stuff to breathe, there are very few industrial processes which do not need this life-giving 'vapour'.

When it comes to fishkeeping, there is no finer way of maintaining 'sweet' water in your aquarium or pond than by simply adding an airstone or two via air pump or blower, though it has to be said that only a tiny amount of oxygen is added by these means; most is added by the turbulence of the water by increasing the absorptancy of oxygen at the air/water interface.

Oxygen is produced in industrial quantities by means of a process known as 'Fractional Distillation', when liquid air is heated and the lighter fractions rise to the top as oxygen, the heavier fractions being bled off at lower levels; much the same technique as is used when refining oil.

Needless to say, this explanation is written in the simplest terms and there is much more to it than that! For example, if you tack on another atom to the formula (O₂) then you produce ozone (O₃), but that's another story altogether.

Acknowledgements

I am indebted to Mrs. Fay Huidekoper, Cope of al-Khobar, Saudi Arabia, for her help with maps and references of the Aftan River, and Brian Fox for reading the manuscript and making many useful suggestions.

Aftan River Fact File

First record: 8th Century BC.
Pliny wrote about it 1st Century AD.
Al Idrisi spoke about the Aftan River in mediaeval times.
Sadleir, 1819, recorded it as being seasonal and doubted it being termed a river.
1968 Completion of the al-Hasa drainage system.
1973 Landsat photograph showed water following the ancient Aftan River course.
The Aftan remains seasonal today.

Native Fauna and Flora

- 1 Arabian Killifish (*Aphanius dispar*), an excellent aquarium fish living in fresh, brackish and salt water.
- 2 Freshwater Mullet (*Liza abu*), last collected from Aftan River May, 1984.
- 3 Marsh Frog (*Rana ridibunda ridibunda*), the only frog found in Eastern Saudi Arabia.
- 4 Striped-neck Terrapin (*Mauremys caspica caspica*).
- 5 Persian Gecko (*Hemidactylus persicus*).
- 6 House Gecko (*Cyrtopodion scaber*); the two geckos coexist.
- 7 Bacopa (*Bacopa monnieri*).
- 8 Horwort (*Ceratophyllum demersum*).
- 9 Indian Fern (*Ceratopteris malchoides*), disappeared 1968-1971.

Introduced Fish

- 1 Eastern Mosquito Fish (*Gambusia holbrooki*) appeared in the Aftan River around 1983.
- 2 Sailfin Molly (*Poecilia latipinna*), first noted 1992.
- 3 *Oreochromis aureus* (No common name) introduced 1981?
- 4 Nile Tilapia (*Oreochromis niloticus*), black and normal coloured, introduced 1981.
- 5 Mossambique Mouthbrooder (*Oreochromis mossambicus*) introduced 1981?

1

A RIVER



1 Aftan River flowing through sand dunes in the Jafurah Sands.

2 Arabian Killifish (*Aphanius dispar*) male from Hofuf.

3 A black Nile Tilapia (*Oreochromis niloticus*) male.

4 Marbled Molly female (*Poecilia latipinna*) from Qatif Oasis

5 Male Mosquito Fish (*Gambusia holbrooki*) from a freshwater spring at Hofuf.

6 Marsh Frog (*Rana ridibunda*) pair mating among Bacopa at Hofuf.

7 Freshwater Mullet (*Liza abu*) from main drainage ditch at al-Hasa. This is a preserved specimen which was deposited in the Natural History Museum (London).

8 The Striped-necked Terrapin (*Mauremys caspica caspica*) is a timid creature. This specimen was photographed at Qatif.



REBORN SAUDI ARABIA

William Ross traces the re-emergence of the Aftan River and its native and introduced species.

Photographs by the author

Look at a modern map of eastern Saudi Arabia and one thing that will strike you will be the absence of rivers. However, a 19th Century map does show one: the Aftan River. Marny Golding writing in *Atlas Volume 8* (1984) states that the river ran at least twice in the past, probably along the same course just north of "Hasa" and suggested that the river ran more easterly between 8th Century BC and Sasanian times.

Al-Idrisi, the medieval Arab geographer at the court of Roger of Sicily, spoke of a river called the Aftan, originating in central Arabia and terminating in the Arabian Gulf. In Sadleir's *Diary of A Journey Across Arabia* (1819) he comments on the course of a river inserted in many maps, running close to Ul-Ahsa. He concludes that the many torrents formed by the winter rains are only periodical and that they ought not to be magnified into a river.

Sadleir also recorded that the Arabs insisted that there was an underground river which gave rise to numerous springs, including those in the neighbourhood of Bahrain. He considered this to be a figurative description, rather than a premeditated falsehood.

A map of Arabia published in January, 1834 by W. Dalton Jr. of Holborn, shows a river with the legend: "Aftan River, only after heavy rain". A 1905 map records a Wadi Aftan (a wadi is a dried up river course). It is obvious, therefore, that there is some controversy over the Aftan River.

Rebirth

In January 1973, a Landsat photograph shows water flowing from north of al-Hasa, following the approximate course of the Aftan River. This apparent rebirth of the Aftan follows the completion, in 1968, of the main al-Hasa drainage canal system.

According to Potts (1990), reports of the existence of this riverine system can be traced back to the time of Pliny writing in the 1st century AD. Unaware of the preceding history, I described the seasonal water flow from al-Hasa, in an article for *Aquarist & Pondkeeper* in 1984.

In this land of sun and sand it is a relief to find anything that resembles a river. The *Concise Oxford Dictionary* defines 'river' as: "Copious stream of water flowing in channel to sea or lake or marsh or another river" and, under 'sea', one definition reads: "Particular tract of sea partly

or sometimes wholly enclosed by land and usually distinguished by special name".

During periods when the water from al-Hasa is insufficient to maintain a channel to the Arabian Gulf, it terminates in a *sabkha*. This area was christened an "evaporation sea" by the companies who built the drainage system. Taking the two definitions quoted and considering that the flow of water seasonally terminates in either the Gulf or in the *sabkha*, I consider the Aftan River reborn.

The present river supports a range of animals and plants, some of which possibly date back to the original Aftan River. The source of today's river is the many springs of the al-Hasa oases which arise from aquifers that have their origins under the Tuwayq Escarpment. These aquifers are possibly the underground river that Sadleir disclaimed in 1819.

The water is pumped and channelled from the springs to irrigate the plantations. It then drains into small ditches which eventually unite to form the main drainage channel.

Native fish

1 Arabian Killifish

The Arabian Killifish (*Aphanius dispar*), or Hassoon, as it is locally known, lives in freshwater, brackish and marine conditions. In the past, I have published various articles on this species in *Aquarist & Pondkeeper* (see, for example, *An Arabian Killifish*, September 1978; *Speckled Arabian Killifish*, March 1979 and *Colour Variations of *Aphanius dispar**, February 1980). Another article on this species to appear in *A&P* was *The Killies of Oman* by Ray Hocking, September 1987.

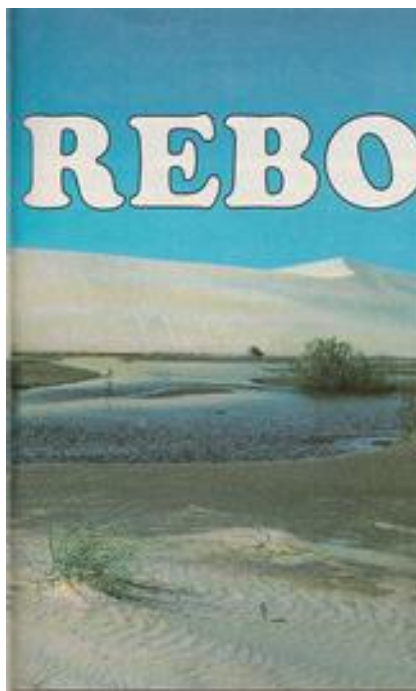
From an aquarist's point of view, this is possibly the most interesting fish to occur naturally in the Aftan River.

Unfortunately, the introduction of Mosquito Fish, *Gambusia affinis*, and the Sailfin Molly, *Poecilia latipinna*, to the al-Hasa oases appears to have been detrimental to the local Arabian Killies and they appear to be on the decline.

2 Freshwater Mullet

The Freshwater Mullet (*Liza abu*) is found throughout the Euphrates basin. This species was fairly abundant in the Aftan River and was to be found in the main overflow stream.

Unfortunately, with the introduction of "Tilapia" in 1982, this fish has now disappeared. It is sad to have witnessed the loss



of this species which has a very limited range, within which it is still at risk.

The plans of the Turkish government to build 22 dams and 19 hydroelectric stations in the Tigris-Euphrates basin is causing great concern. The Southeastern Anatolia Project involves irrigating large areas of land and will reduce the quantity and quality of the water reaching the lower reaches of the Euphrates and may reduce suitable habitats for *L. abs.*

Introduced fish

There are at least five species of introduced fish in the Aftan; two livebearers and three cichlids, all of fairly recent origin.

1 Eastern Mosquito Fish

According to our editor John Dawes, (1992), the Mosquito Fish (*Gambusia holbrooki* — closely related to *G. affinis*) is the most widespread of all Poeciliid fishes that are known to exist as wild, reproducing populations in locations outside their original ranges.

Saudi Arabia appears to have become a member of the Eastern Mosquito Fish's range when they were introduced to al-Qatif and Yabrin oases for mosquito control prior to 1950. The appearance of *G. holbrooki* in the Aftan River was first noted by me in 1983. Since then, their numbers appear to be on the increase.

2 Sailfin Molly

The Sailfin Molly (*Poecilia latipinna*) is a fairly recent introduction to the Aftan River, first noted in 1992.

However, it has been established in eastern Saudi Arabia since, at least, 1984. At that time, it was to be found in large numbers at al-Qatif oasis. This introduction possibly arose from fish discarded from the aquarium hobby.

3 African cichlids

Three species of cichlid are to be found in the Aftan River. *Oreochromis aureus* was an accidental introduction through the fish farms at al-Hasa, while the Nile Tilapia (*O. niloticus*) was introduced to the springs in an effort to reduce the growth of algae and aquatic vegetation. Some of these *O. niloticus* possibly came from escapees from the fish farms as well.

A number of all-black Nile Tilapia are to be found in the Aftan River. A strain of all-black males is found elsewhere in Africa, in Lake Zwai in Ethiopia, and in a crater lake on an island in Lake Turkana (Rudolph); and possibly in some small lakes in Ruanda.

There is evidence that the Mossambique Mouthbrooder (*O. mossambicus*) was accidentally introduced at the same time as *O. niloticus*. From some specimens collected and examined at The Natural History Museum (London), it is apparent that hybridisation has occurred between these species.

The three cichlids are maternal mouthbrooders and can be maintained in aquaria, where they mature at a relatively



Bacopa in flower at Aftan.

small size. I have, for example, spawned *O. mossambicus* when they were only approximately 10cm (4in) in length.

Amphibians & reptiles

Amphibians and reptiles are few and far between on the Aftan River. There are three which I have found.

1 Marsh Frog

The Marsh Frog (*Rana ridibunda ridibunda*) is the only amphibian found in the Aftan River. Locally collected animals are often to be found for sale in some of the pet shops in al-Khobar.

2 Striped-neck Terrapin

The Striped-neck Terrapin (*Mauremys caspica caspica*) is often found basking in the sun at the water's edge. It is a very shy creature and will usually take refuge in the water when it is disturbed.

3 Persian Gecko

The Persian Gecko (*Hemidactylus persicus*) is often to be found in fissures and cracks in the concrete walls of the irrigation canals. It is nocturnal by nature but it is often active during the day in the darkened interiors of the plantation buildings where it coexists with another smaller gecko *Cryptopodium scaber* (Heyden, 1827).

Plants

The following three species which are found in the Aftan River, are all widely available within the aquatic hobby and have long been strong favourites the world over.

1 Bacopa

Bacop, (*Bacopa monnieri*) is a procumbent weed of wet ground which can grow up to 30 cm (12in), with small white to pinkish violet flowers.

It will grow submerged in aquaria, but it is slow to develop and does not appear to flower under these conditions.

2 Hornwort

Hornwort (*Ceratophyllum demersum*) is a submerged perennial plant growing to 1m (39in) or more, but with no roots. One of the few truly aquatic plants, it can be weighted down and grown submerged as an aquarium plant.

In these conditions it tends to grow long and stringy, but remains thick and bushy

where it reaches along the surface of the water. When it becomes too stringy, the thick top part can be cut off, weighted down and placed back in the aquarium, thus forming a bushy plant once again.

3 Indian Fern

Fossils of Indian Ferns (*Ceratopteris thalictroides*) were recorded from the Rub' al-Khali (the Empty Quarter) which lies south of al-Hasa, by Mandaville (1986).

Unfortunately, many, if not all, of its habitats were destroyed between 1968 and 1971 during construction of the modern irrigation and drainage system. As a result, I have been unable to find this plant in the river.

Debatable rebirth

I took the liberty of calling the "Aftan River" a river; if a river it is! The natural occurring fish fauna of this stretch of water is limited and, with the addition of the introduced species, it will remain limited but, at least, a little more diversified. A great price has been paid for this diversification with the loss of the Freshwater Mullet.

In the Palaeontological Survey of the Eastern Province (1980), fish fossils of five freshwater and one marine species consistent with the Late Lower Miocene age (15-17 m yr) were identified, but evolution has changed eastern Saudi Arabia. Comparison of the fish fauna of the Late Lower Miocene age with that of the Aftan River of the late 70's shows a decrease in the number of species available, with only two freshwater fish remaining; evolution has taken its toll.

With the improved water management at al-Hasa, the survival of the two species should have been assured, but, in reality, this is not so. The introduction of 'exotics' for one reason or another, has had a detrimental effect on the local fish population. I thank technology for the rebirth of the Aftan River ... but debate the wisdom behind the introduction of foreign species.

211

Further Reading

- Dawes, J. (1992) My favourite Fish. *Aquarist & Pondkeeper*, January, p.11-14.
- Mandaville, J.P. (1986) Plant life in the Rub' al-Khali (the Empty Quarter), south-central Arabia. *Proceedings of the Royal Society of Edinburgh*, 86B, 149-157.
- Mandaville, J.P. (1990). *Flora of Eastern Saudi Arabia*. ISBN 0-7103-0371-8.
- Potts, D.T. (1990). *The Arabian Gulf In Antiquity*. Vol. 11, p. 29. ISBN 0-19-814391-5 Vol. 2.
- Ross, W. (1984). *Mystery Fish of Saudi Arabia*. *Aquarist & Pondkeeper*, May, p. 21-23.
- Ross, W. (1984). Expatriated mollies. *Tropical Fish Hobbyist*, 32 (11).
- Trewavas, E. (1983). *Tilapia fishes of the genera Sarotherodon, Oreochromis and Danakilia*. 583 pp. British Museum, London.



FROGS AND FRIENDS



Ponds in danger

Following on from last month's Herpetofauna Recorders' meeting where the status of amphibians and ponds was discussed, help is URGENTLY needed to survey the remaining ponds and other small water bodies throughout the British Isles.

The Pond Conservation Group (a consortium of natural history organisations) estimate that approximately three-quarters of Britain's ponds have been lost since the 1880's — a total of nearly one million. Government figures show that about two thousand ponds are currently being lost every year.

The British Herpetological Society (BHS) state that about a fifth of the remaining ponds are very overgrown and are unlikely to exist for much longer without management. This not only rep-

By JULIAN SIMS

resents a threat to the long-term survival of some of Britain's native species of amphibian due to the loss of their breeding sites, but will also cause some species of freshwater invertebrates and water plants to become locally extinct.

During the National Amphibian Survey, only 5% of the land area of Great Britain was surveyed for ponds, so there is no information for the remaining 95% of the land. In particular, information for certain types of landscape, including intensively farmed lowland areas and moorlands, is required.

In order to gain a much more complete picture about the num-

ber and condition of Britain's ponds, the BHS are currently conducting a nationwide survey. Information which can be collected during this spring and summer about the presence (or absence) of breeding amphibians will be particularly valuable.

If you are interested in taking part in the collection of information about the current state of Britain's ponds and where they occur, then further details about this survey, together with recording forms, are available from:

**BHS Pond Survey,
Dr M Swan,
19 St Judith's Lane,
Sawtry, Huntingdon,
Cambs PE17 5XE.**



A long-established pond once colonised by *Pseudis newtoni* but now very overgrown and in need of urgent maintenance to prevent its loss.

JULIAN SIMS

**AQUASPLASH
REPTILES &
ACCESSORIES**
MJS GARDEN CENTRE
BATH ROAD, HARE HATCH
TWYFORD, READING
Tel: (0734) 404188
OPEN 7 DAYS: 9 AM TO 5.30 PM
FREE PARKING
CREDIT FACILITIES AVAILABLE

**VIVARIUM
TECHNOLOGY
CENTRE**
4 CROSS STREET, SAFFRON WALDEN, ESSEX
CB10 1ES. TEL: 0788 13379
FAX: 0788 13384
Britain's Principal Mail-Order Suppliers of Reptiles,
Amphibians, Fish, Vivariums and Equipment
Send 2 x 24 stamps for catalogue
Wholesale Technology Products from our Cam-
pany that started it all!

Oxma Mere —
an ancient dew
pond on the
Wiltshire Downs
— which is men-
tioned in the
Domesday Book
of 1086. This
pond is
colonised by
Great Crested
Newts.



JULIAN SIMS



**Avian & Exotic
Veterinary Centre**
A veterinary practice specifically set
up to cater for veterinary care and
management of all 'exotic' animals
Insects, Lizards, Chelonians, Amphibians,
Fish, Land and Marine Invertebrates
9 Maclean St. St. N. N. & S. M. C. V. S.
Kilferland House, Ascot Road,
Toucheville End, Nr Maidenhead, Berks
SL6 3LA. Tel: 0628 37714/24935/33973
Consultations by appointment

THE PET SHOP OF PETS WOOD
121/123 QUEENSWAY, PETS WOOD, KENT
Tel: (06889) 825543
HOURS: Mon, Tue, Thu, Sat 9am -
5.30pm. Wed 9am - 1pm, Fri 9am -
7pm. Sun closed.
Reptiles, Amphibians, Vivariums
Full range of equipment and food.
Friendly advice

**G. MURRAY &
M. HUGHES**
Suppliers & Breeders of Reptiles
Buy with confidence! We offer you the opportunity
to purchase direct from the breeders, superb ap-
petite food stocks, together with expert advice. Also
a full range of equipment and books. Please look
for your free catalogue and stock list
Shedden Barn House, off St. Margaret's Road,
Bungay, Suffolk IP25 1PZ
0986 892210

KB WORLD OF PETS
1A APPLETON ROAD, SLUDWORTH
MANSFIELD, NOTTS
NEW SHOP NOW OPEN
Reptiles, Spiders, Stick Insects,
etc — You name it, we can
supply it!
Also Birds, Pets, Tropical, Marine,
Coldwater Fish
TEL: 0623 490270

LIMESTAR TROPICALS
The area's main stockist of captive
bred and wild caught reptiles and
amphibians. Suppliers of live and
dead foods.
61 HIGH ST., TARVIN,
CHESTER
TEL: 0829 740333

**CAJEX
ACCESSORIES LIMITED**
The Bury Farm, Pednor Road
Chesham, Bucks HP5 2JU
Tel: 0494 791584
Cable Heaters, Vivariums, Lighting
Controls, Thermostats, Lids, Food &
Fauna Boxes

**WEST'S
OF COLCHESTER**
STANWAY GARDEN CENTRE
on the B1408 at Stanway, Colchester
Tel: 0206 210360
Probably the largest selection of Reptiles,
Lizards and Spiders in East Anglia.
All accessories, vivariums, food, heat mats,
etc. ALWAYS AVAILABLE.
EXPERT ADVICE READILY GIVEN

Herp Fact/record sea turtle

Marine turtles are usually thought of as inhabitants of warm waters, such as the Mediterranean and Caribbean Seas. In fact, the world's largest and heaviest turtle recorded to date is a Leatherly Turtle or Luth (*Dermochelys coriacea*) which was washed up on a beach below Harlech castle, North Wales on the 23 September 1988!

This specimen, a male, was quickly transported to the National Museum of Wales, Cardiff, where it was kept at -10°C (14°F) to preserve the tissues until the reptile could be prepared for display. This work included making moulds of the flippers and the removal of the skeleton and flesh.

The record dimensions of this giant turtle include a total length of 291cm (113 1/2 inches), 227cm (108 inches) from flipper tip to flipper tip (front), and a body weight of 916kg (2,106 lb).

Leathery Turtles feed on jellyfish, large numbers of which were present in the Atlantic Ocean to the south-west of Britain and Ireland in 1988. The jellyfish were drifting in the Gulf Stream and this high density of potential food corresponded with a very high number of marine turtle sightings — at least 24 from June to October 1988.

Of these sightings, nine were dead turtles washed up on beaches. One of these was the record Leatherback at Harlech.

Helpful guide

The Herpetofauna Worker's Guide is a useful 56-page booklet recently produced for Herpetofauna Conservation International Ltd (HCIL). This publication is supported by the

Military history

I have recently come across an interesting book which covers colonial government in the Gilbert and Ellis Islands (now Kiribati and Tuvalu), the geology

of coral atolls, occupation by an enemy force during World War II and natural history in this part of the Pacific.

Don't Step on a Stonefish! by Dan Raschen certainly combines a broad range of subjects in an entertaining and readable style.

Published by Buckland Publications in 1993, this hardcover book is 176 pages in length and is illustrated with 20 maps and diagrams. It costs £14.95 (ISBN: 0-7212-0848-7). Check out a copy at your local library.



LAURENCE E. PETERSON

All known Common Toad migration routes are listed in the useful HCIL guide.

Department of Transport and has been partly funded by a grant from the Department of the Environment.

After a brief introduction, the guide contains a six-page section about local reptile and amphibian groups throughout Britain, together with the names and addresses of regional representatives.

Sections three and four give the names and addresses of statutory bodies and voluntary organisations involved with natural history in general, and herpetology in particular.

Section five provides a summary of Wildlife Legislation in the United Kingdom. Other sections include information on resources for herpetologists; for example,

grants to start and support voluntary conservation projects, and suggested further reading about the distribution of Britain's reptiles and amphibians.

Comprehensive details (fifteen pages, including grid references and road names) of all registered Common Toad (*Bufo bufo*) migration sites, from Cornwall to the island of Raasay off the west coast of Scotland, are given in Annex I towards the end of the booklet.

A copy of this helpful publication can be obtained FREE OF CHARGE by sending an A5 stamped addressed envelope to:

HCIL,
Triton House,
Bramfield,
Suffolk IP19 9AE.

TACHIBROOK TROPICALS LTD
244 VALDORF ROAD, BRIDGE ROAD
LONDON SW1V 1AU
TEL: 071 834 6179
Large selection of Xenopus Toads, Anolis — black, white, albino, Tree Frogs, Lizards and Geckos.

BOOTH'S VIVARIUM FISHWORLD
261 WENEAGE ROAD, GRIMSBY,
SOUTH HUMBERSIDE DN32 9NH.
Tel 0472 346519
LARGE SELECTION OF REPTILES
Full range of Marine Tropical and coldwater fish, equipment, books and foods.
Open 7 days Sun 11 am-4 pm

AQUATICA
37 BROOK STREET,
WAKEFIELD, YORKSHIRE
25 Tanks with Reptiles, Snakes,
Amphibians and Spiders
Vivariums made to order
Frozen and live foods
MOST EXOTIC SNAKES & REPTILES
AVAILABLE TO ORDER
TEL: 0924 284473

WET & WIGGLY
Good range of Reptiles, Snakes, Lizards,
Spiders and Scorpions
Good range of usual and unusual Fish,
Tropical and Coldwater
76 Brighton Road, Harley,
Surrey RH6 7JG
0293 772771

AQUATIC SERVICE (UK) LTD
REPTILES, LIZARDS & SPIDERS
AND ALL ACCESSORIES
Also MARINES, TROPICALS &
COLDWATER
JARDINERE GARDEN CENTRE
MAGENHEAD ROAD, WINDSOR, BERKS
TEL: 0753 830742



REPTILES & AMPHIBIANS
Top quality reptile-bred specimens
available. Stock changing weekly. Please
phone for any information, advice, etc.
Trade supplied
**TRANSCONTINENTAL
GOLDFISH CO.**
1/4 HAMPSONS GARDEN CENTRE
Lang Lane, Dulton, Huddersfield
Telephone: 0484 420400

RED KNEES & REPTILES
118 Camberwell Road
Camberwell, London SE5
Reptiles, Amphibians, Food &
Equipment
Friendly Advice and Service
always available
Tel: 071 701 6012

ZENTEC
State of the Art Vivarium Heating
Control Information from ...
10 LLOYDS COURT MAJOR ROYAL
CRAWLEY, WEST-SUSSEX, BN10 2QX
TEL: 0292 400 129. FAX: 0292 400 129

THE REPTILE-ARTIUM
QUALITY REPTILES &
ACCESSORIES
WE STOCK EVERYTHING
FOR YOUR HERPETOLOGICAL
NEEDS — WHY NOT
GIVE US A CALL
The Reptile-arium
Calvert Farmery
Cattle Gate Road
Suffolk
Tel: 367 9991
OPEN DAILY
MAIL ORDER

Tomorrow's Aquarist

BY GINA SANDFORD



Newt watch

Spring is just around the corner (really!) and there will soon be frenzied activity in garden ponds. Indeed, depending on what part of the country you live in, this may already have happened.

Most of us have collected frog and toad spawn at some time or another — if not to hatch at home then to hatch at school — but how many of us have seen newt eggs?

There are three species of newt in Britain, the Common or

Smooth Newt, the Palmate Newt and the Great Crested Newt (a protected species). For most of the year, newts live on land, where they feed on slugs, snails, worms etc. during their nocturnal forays. In spring and early summer they seek out ponds in which to breed.

If you are really lucky, you may even see the more colourful males displaying to females, posturing, flexing their tails and swaying back and forth.

The eggs are laid singly on a water plant and the leaf is often wrapped around the egg. When the tadpoles (or should we call them newtpoles?) hatch, they have three pairs of feathery gills. The front legs develop before the hind legs and by mid to late summer, some of the larvae will have completed their metamorphosis (change from juvenile to adult form). However, some will over-winter, not becoming adult newts until the following summer.

TA competition

How would you like to win a Tetra Club Holdall? You would? Then just read the three following Goldfish Facts and then answer the three questions at the end. Good Luck!



1 Tish the Goldfish

Goldfish are by far the most popular species of coldwater fish. Meet Tish who, at 37 years old, is probably the UK's oldest living Goldfish.

The remarkable story of Tish came to light when owner, **Hilda Hand** from Yorkshire, wrote to Tetra telling them that she has never fed Tish on anything other than their fish food. "It's extremely unusual for a fish to live to such a ripe old age," comments **Dr David Pool**, Head of the Tetra Information Centre. "I have checked with the Guinness Book of Records and the oldest recorded age ever is 41. So Tish is fast closing in on a place in the record books!"

2 Colour changes

Some Goldfish colour changes can be reversed. If the fish is in poor health — due to disease, poor water quality or bad handling — prompt treatment will ensure that it regains its normal coloration within a few days.

If the diet is lacking the required colour enhancers (found in the wild in shrimps, algae, etc) the fish will gradually become paler. This can be easily avoided by giving your fish a balanced nutritious diet which includes natural colour enhancers.

The surroundings also play a part in coloration. Fish kept with a light background will become paler, while those in dark surroundings will become darker.

3 Did you know?

Did you know that Goldfish have a better sense of smell than humans? In fact, it is even better than a Bloodhound's!

This is because the smell receptors are not limited to the nostrils, as in dogs and humans, but are situated all over the front of the fish's head. Their sense of smell even allows Goldfish to locate food which is hidden in the gravel and in the dark.



Tish the veteran Goldfish, and proud owner Hilda Hand.

THE COMPETITION

If you would like to win a free Tetra Holdall, answer the following three questions and send your answers, with your name and address, to **Aquarist & Pondkeeper Competition**, Tetra, Lambert Court, Chestnut Avenue, Eastleigh, Hants SO5 3ZQ.

- 1 How old is Tish?
- 2 What are the four main reasons for changes in fish coloration?
- 3 Where are the smell receptors on a Goldfish?

The closing date for receipt of entries is **31 March**, and the first ten correct entries to be drawn will each receive a Tetra Holdall.

Fin shredders

Most people think of spiny catfish, but how many of us realise that *Botia* Loaches also have spines? Not fin spines, admittedly, but eye spines. These are known as *bidid* spines. The fish can erect them and lock them into position at will and, although they appear quite fine and insignificant, they are, in fact, very sharp.

When aggravated or attacked by a predator, the spines are erected and the *Botia* will attempt to defend itself, often shredding the fins of the attacker.

The most aggressive species I have come across is the so-called Coldwater Loach (*Botia superciliosa*). My specimens think nothing of launching an often unprovoked attack on a pair of cichlids. At their most aggressive, they swim up to the flanks of the fish, flick out their spines and slide them along the cichlid's body, leaving deep scratches which mark the cichlid's scales, but fortunately, do not open wounds. The effects on the cichlid's fins are worse, as they actually tear the fins to shreds.

In the wild, Smith, in his work *Freshwater Fishes of Siam* (of Thailand), reports that these spines may act to discourage attacks by snakes and fish, as both have been seen with cuts to their necks caused by the spines of partially swallowed *Botia*. The results were disastrous.

If you handle these fish, you need to be very careful, because the spines will tangle in the net; they will also puncture plastic bags! To prevent them doing so, make sure that the corners of plastic bags are taped up so that



the frightened fish cannot wedge itself and cause both the bag, and itself, any damage.

Loaches, including Clowns, have powerful spines which can cause injury.

My plants won't grow

How many times have I heard that? Plants need space to grow and thrive. With just a little thought, we can give them a fighting chance in the aquarium. Here are a few tips.

1 Check your lighting. Even the best lighting systems have a given period when they are at peak efficiency and, once light output starts to drop, the plants will suffer. So, replace any old tubes.

2 Always plant your specimens individually. Yes, even things like *Calceolaria* it's time-consuming and sometimes frustrating, but it pays off in the end. By grasping a bundle of plants, the stems become bruised and may rot. You would never think of planting two rose bushes in the same hole in the garden, would you? So why think that aquarium plants can be planted in clumps?

3 Give each individual plant room to grow and spread itself. The distance between plants would be the spread of the leaves. This allows light to reach the lower leaves and stops them from dying off.

4 I used to plant potted plants in their pots and just let the roots escape through the slots round the sides and bottom, but I found I had more success (and more plants) by removing them from their pots. To my amazement, what I thought was a single plant were three or four small plants. Planting each one separately, I got better value for my money.

5 Remember that some plants like shade and others bright light, so position them accordingly.

6 Likewise, some prefer running water, and others still water.



Even so-called 'bunch' plants grow better when planted individually.

Wild river

Finally, did anyone see the TV programme on my favourite river, the Colorado, back in January? It concentrated on the first 20 miles, the only part that can still be termed the 'wild river' which, fortunately, is now in a National Park and therefore protected.

There were some wonderful underwater shots of introduced salmon spawning and Dippers preying on the salmon eggs, as well as Kingfishers diving for Minnows.

The thought-provoking point was that the available water to maintain this habit is diminishing: it is diverted for irrigation almost as soon as it leaves the snow fields. And, except in times of flood, not a drop of water that leaves the source of the mighty Colorado reaches the sea! It is trapped by a series of no fewer than fourteen dams.

This was stimulating stuff about man's inhumanity to the natural world.

LAKESIDE '94 FISHKEEPING EXHIBITION

TRADE STANDS
CLUBS
SOCIETIES
FROM PONDS - MARINES



KOI SALES

SEMINARS
NICK DAKIN - MARINES
Dr DAVID FORD - NUTRITION
GINA SANDFORD - CATFISH
BERNICE BREWSTER - KOI
& PAULA REYNOLDS

COMPETITIONS

Dr DAVID POOL - TROPICAL
Dr KEITH BANNISTER -
BLIND CAVEFISH
GRAHAM FOX - MARINES
PAUL LAMBERT -
ENDANGERED SPECIES

SEMINARS £1.50 EACH OR 3 FOR £3.00

SAT 28TH MAY-30TH MAY

LAKESIDE COUNTRY CLUB · FRIMLEY GREEN · SURREY

TICKETS: ADULTS £1.50 · CHILDREN, OAPs 75p
FAMILY TICKET (£3.75)

SUPPORT AQUATIC CONSERVATION!

INTERNATIONAL CONFERENCE ON AQUATIC CONSERVATION & ENDANGERED SPECIES

PRESENTED BY BILL ODDIE
27th May - 7 pm

Guest Speakers:

TOM SPENCER, MEP ★ DR KEITH BANNISTER
RICHARD SANKEY ★ KEITH DAVENPORT
OTHERS TO BE ANNOUNCED

FOLLOWED BY DINNER & CABARET
FIRST TIME APPEARANCE AT LAKESIDE...

**THE FABULOUS
WEST END SHOW STOPPERS**
★ ALL THE TOP MUSICALS ★
WHOLE EVENT £30 OR DINNER &
CABARET £25

PRESENTED BY THE MINIATURE REEF SOCIETY &
THEMELINE EXHIBITIONS LTD
★ BOX OFFICE 0276 23728 ★

SEAVIEW

BY GORDON KAY



Silent dolphins

It was with more than a tinge of sadness — not to say a load of disappointment — that I recently read a letter which had been sent to Dolphin, the newsletter of International Dolphin Watch.

The letter, entitled "From Joy to Sadness", was from Valerie Cooper, the mother of a handicapped son, who had been dismayed by the change which had befallen Dolphin Reef at Eilat.

You may recall that, in May '92, Valerie took her son to Eilat to swim with the dolphins there. The effect was amazing, with her boy quickly riding, swimming, talking and laughing, as

well as doing all manner of other things he couldn't manage before. His medication was also reduced.

Wonderful? Certainly, but the new letter told not of the Dolphin Reef of a year ago, where the animals were free to come and go as they pleased, but of creatures confined to an enclosure, creatures that gave off an aura of sadness and resignation. The dolphins were totally silent.

It would appear that Dolphin Reef has become a commercial venture, where the dolphins now perform tricks for a paying audience.

Mrs Cooper's wasn't the only letter along those lines. It was supported by three others, all telling a similar story.

Now, while there is nothing to stop this type of organisation existing, well, you know my views on captive cetaceans, I just think that it's very sad.

In the January issue of A&P we published an article entitled Dolphin Encounters by Jack Jackson. From the above item, it appears that things have changed since Jack visited Dolphin Reef. We therefore would welcome any further details which our readers might be able to offer us. Ed

- (3) The fact that all of the aquarium's occupants are still going about their business in the dark.
- (4) The fact that several of the occupants peck at my arm while I'm working in the aquarium.

I could go on. The point is that I firmly believe that seawater animals in long-term captivity are not the animals which were caught on the reef. I know that they are never tamed in the accepted sense, but they certainly become conditioned to the extent that they do not fully exhibit natural behaviour. Only Cleaner Wrasses seem to perform as they would in nature.



Idyllic scene at Dolphin Reef. Things appear to have changed, though.

JACK JACKSON

Lost 'memories'

Isn't it strange how your mind works? I was sitting looking at my aquarium the other day, lost in it all, as I usually become, when I started to wonder if my fishes ever remembered their coral reef.

They have been in the glass box that is their home for years. Is that all they know? We have been told that the memory span of a fish is about five minutes, and I could offer plenty of evidence to support my theory that our fishes wouldn't know a coral reef if one jumped up and bit them!

If I'm right, then how much credence can we place on

behavioural observations we make with animals which have been in captivity for longer than a few days?

The evidence I would use to support my argument is:

- (1) The fact that animals such as Lionfishes don't stop eating — even though in the wild they would eat only every other day or so.
- (2) The fact that Puffers and Triggers eat lettuce!

Lakeside update

You may remember me talking about the Mini-Reef Society and its aim to raise £50,000 to help rebuild the aquarium at London Zoo. Well, I can now bring you more information about Lakeside '94 — the aquarium show which is the vehicle by which the dash is to be raised.

Lakeside '94 is a joint project between the zoo and the hobbyist, with manufacturers and importers/distributors being invited to exhibit. There will be a trade fair on the first day, which — it is hoped — will attract hundreds of retailers.

During the evening of the same day, there will be the rather grandiosely titled International Conference on Conservation and Endangered Species. I'm told that speakers for this will be confirmed soon.

The show proper starts on 28 May, for three days. As well as the usual fayre of stands and other exhibits, there will be a total of fifteen lectures — five on each day — with personalities such as Mr T. Spencer, the Euro MP for West Surrey — who is also on the Environmental Board of the EU, Nick Dakin, Dr David Ford, Dr David Pool and Graham Cox.

There will also be fashion shows, children's entertainers, competitions and a London Zoo stand, where visitors can meet the staff. You will also have the chance to join the Mini-Reef Society!

For further details ring Peter Newman on 0276 23728.

SNIPPETS

1

The scientific name for the Spotted Dolphin is *Stenella plagiodon*, and for the Bottlenose Dolphin *Tursiops aduncus*.

2

Cetaceans — dolphins and whales — very probably didn't evolve their huge size by accident. After all, it is often said that "big is best". There would be many advantages to large size on earth too, but increased size and weight here would mean an additional burden on supporting limbs. No such problems apply in water, however, and creatures like the Blue Whale swim in fear of no-one ... except man, that is.

3

The living sharks are divided into eight major groups, or

orders, each recognised by some external characteristic. Each of these orders contains one or more smaller groups, called families. In all, there are thirty families of sharks, which contain 350 or more species.

4

Many of the reef sharks — especially the Black-tipped Reef Shark — rest in caves or underneath coral outcrops during the day. Their heart and respiratory rates slow significantly at these times, and they could be termed as sleeping. They are even cleaned by shrimps and cleaner fishes.

5

We all know that conditions conducive to flourishing reef-building corals and their symbiotic algae fall into a very narrow band and are only found in the Tropics. More specifically, however,



Feeding stony coral photographed in the Red Sea. Below 18°C feeding and growth drastically slow down (see Snippet No 5).

L. W. H. V. M. W. H. M. W. H. M.

below 18°C (64°F), coral growth is so slow that bio-erosion would occur faster than the formation of coral framework. Also, other competitors for shallow water substrates — kelps, Sargassum, etc — would take over.

6

There are over 600 genera and 330 known species of coral to be found on the Great Barrier Reef.

7

Plants are a vital part of any reef's ecosystem. On inshore reefs, mangrove trees may grow on the 'cays', and seagrasses abound wherever there are shallow, sandy areas. However, most marine plants are algae. Scattered in the water, single-celled phytoplankton, such as Dinoflagellates, occur in their millions. By contrast, *Valonia*, though also single-celled, is as big as a golf ball!

FASCINATING FISH FACTS

One day in a cocoon sounds bad enough ... but four years?!!



LINDA LEWIS

Cocooned against the elements

Lungfish have ventrally located paired lungs, just as in land-living animals. The existence of these lungs 'demands' certain basic biological requirements such as a four-chambered heart (as in

humans). Lungfish, consequently, have this type of arrangement.

As the swamps, pools and ditches in which they live dwindle with the onset of the dry season, Lungfish burrow into the soft bottom mud. Gradually, each fish widens the end of its tunnel until it can turn its head upwards to face the opening.

When the water level falls below this opening, the Lungfish blocks it up with porous mud. It then curls up in the enclosed chamber and secretes a mucus cocoon, leaving a small opening for the mouth. The cocoon then hardens, trapping the small amount of water it contains, thus keeping the Lungfish's body moist. The fish then goes to sleep (it aestivates — the opposite to hibernates), slowing all its body processes down to a mere ticking over.

Dry seasons usually last three or four months, but Lungfishes can survive up to three or four years in their cocoons. When the rains return, the water dissolves the cocoons and the Lungfish emerge — considerably slimmer, but, at least, alive ... and very hungry!

White spot is the most common disease problem in fish keeping

W.S.3.

THE WHITE SPOT TERMINATOR

Quick acting — usually within 24 hours

Now available for tanks and ponds

King British Fish foods & Water treatments

"The perfect combination for those who just want to do it better"

On sale at Aquatic shops, Pet shops and Garden centres



WHAT'S YOUR OPINION



BY BILLY WHITESIDE

My Red Shiner ... or Rainbow Dace male, once known as *Notropis lutrensis*, but now going under the scientific name *Cyprinella lutrensis*.



Rainbow connection

Vernon B. Hunt wrote to us following my publication of a photograph of a Rainbow Dace — as I thought (WYO? October 1993). Vernon, who obviously knows his coldwater fish, told our editor that there is a lot of confusion, even among dealers, about correct names for coldwater fish "outside the Goldfish sphere of influence".

The lovely coldwater fish in my photograph has been on sale in at least three N. Ireland aquarium shops under the name of Rainbow Dace, which is why I assumed it to be thus called.

However, I'm happy to have my ignorance corrected by Mr Hunt. He identifies my fish as Red Shiners, formerly known as *Notropis lutrensis*, and now named *Cyprinella lutrensis*. I'm happy to recommend the fish in my photograph for a coldwater aquarium, whether sold as the Red Shiner, or under the incorrect name Rainbow Dace.

Incidentally, I thought I had

bought three of the fish in question and, when I got home and studied the three, I concluded that one of them was a Bitterling. Dick Mills, in his book *Aquarium Fish*, names the Red Shiner as *Notropis lutrensis*. It certainly seems to be the species I have.

Dick lists two fish under the name Bitterling. The one I have appears to be *Rhodeus sericeus*, a silver-coloured species in which the female lays her eggs inside a bi-valve mollusc. If I recall correctly, former A&P editor Laurie Perkins took some excellent photographs of Bitterling spawning in a mollusc.

Vernon Hunt lives at 120 London Road, Widley, Waterlooville, Hants. I appreciate his help in identifying the lovely Red Shiners for all readers.

It's pleasing to see a big improvement in quality and variety of coldwater fish on sale in the UK. I saw some nice Pumpkineseed, *Lepomis gibbosus*, on sale in **Petworld, Newtown-abbey**, last week, but managed

to resist the temptation to buy any, as they grow to about 8in in length. I also managed to resist some lovely Tanago at **Grosvenor Tropicals** because they might not mix too well with Fancy Goldfish.

Viviparous call

Graham Seddon lives at 199 Victoria Road, St Budeaux, Plymouth, PL5 1RY. He writes: "I've been an avid reader of your section for a number of years. As I am the Fancy Guppy Section Manager of **Viviparous, the Livebearer Information Service**, I am responding to your request for information about Guppies.

"I wish to comment on the decline in the number of Guppy fanciers to only a few dedicated breeders in the past number of years. I want to use your column to stir up a lot of enthusiasm for fellow-fishkeepers to return to the breeding of these fish to allow us

to continue some true strains, or even establish a new one. This would make it possible for me to organise a Fancy Guppy Show at some stage in the future to compete with our European counterparts, as the Guppy is far more popular abroad.

"Further information can be had from the above address if an sase is included."

(See also **Helping Hand** in the January '94 issue of A&P and elsewhere in this issue).

Guppy memories

In Belfast in the 1960s we had a thriving branch of the **Fancy Guppy Association** which met regularly and mounted a stand at a big, annual, Belfast show. If I recall correctly, a gentleman by the name of **Bill McAuley** was the driving force behind the group.

I certainly became a Guppy fanatic; indeed, I was always one. The fish still fascinates me because it is cheap, comes in an infinite variety and is so easy to breed. If you are interested in genetics and fish breeding, it's an ideal subject as it breeds and gestates (produces fry) quickly, so one can easily observe the results of specific crosses in a very short space of time.

When I was a teenager I used to make up special hormone solutions, with the help of a local pharmacist, to colour-test female Guppies for their potential as mothers of well-coloured and shaped offspring.

I also made contact with gentleman Guppy-breeders such as **Ron Baldry**, of London's East End, and his late wife Lily, who sent me Guppies by air to Northern Ireland, and who provided me with a meal and a bed for the night on some of my occasional visits to London.

My most amusing experience was the occasion when Ron dispatched a box of Guppies to me at Heathrow and I went to collect them at Belfast International Airport.

"Would this be your box?" said the man at Cargo Freight, pointing to a coffin-sized box.

"Human remains!" I read, turning my head sideways to the box.

"Ah," said the man, "that'll be one of an elderly couple who saved for years to go to somewhere like Egypt, and the heat killed one of them by the time they could afford it."

"Mummy or daddy?" I wondered as I spotted my small, cardboard box of Guppies from Ron.

Back-breaking pics

Last Christmas Eve, I posted almost 500 labelled fish slides to our editor, **John Dawes** to add to his stock library.

In contrast to the enjoyment I gained from photographing the fish I was astonished by the sheer boring and back-breaking work of cataloguing and labelling them — as well as identifying them in some cases. It took me weeks and weeks. My back now aches permanently! (So does mine from leaning over your slides! Ed).

Crack in the eye

Last Christmas morning I got out my camera and shot half a

roll of fish photographs prior to Christmas dinner. I intended to complete the roll before bedtime. Little did I know what was in store! At 8.15 that Christmas night, I was lying on a table in a casualty department with blood flowing out of my lacerated, right (camera) eye.

A toy kaleidoscope out of a cracker managed to whack me on the cornea — and I can tell you, I was one worried chap! I thought I was blinded. The blood made it seem and look very bad. Fortunately, I got it treated immediately in casualty and am hoping that it may heal safely if

the antibiotic cream works and I manage not to get it infected.

There's something surreal about watching an old, boring Christmas television programme one minute, and lying on an operating table a few minutes later with a bleeding eyeball. 24 years ago on Christmas Eve I managed almost to amputate a hand on a piece of broken aquarium glass. So, avoid kaleidoscopes ... and take very great care with aquarium glass when working with it!

Fast-dying Guppies

The apparent quality of imported Guppies does not seem to have been exceptional of late; hence I was delighted to see some good male and female Guppies on sale in a small pet shop recently.

I bought four of each and was taken aback when the

dealer said, "You do know the females will probably die in a couple of days?"

I thought he was being facetious — until the females gradually died off over the next few days, before I even got time to photograph them in some cases.

Do you have any suggestions/opinions on this?



An attractive half-black Guppy male.

ELLY WHITEHEAD

WHAT'S YOUR OPINION ON THE FOLLOWING:

- 1 Breeding egg-layers in an aquarium
- 2 Breeding live-bearers in an aquarium

Send your letters to me c/o
A&P, 9 Tufton Street,
Ashford, Kent, TN23 1QN.

NEW WAVE

COMPLETE POND RANGE

AQUACLEAR — controls algae and blanket-weed

POND MATURE — filter micro-organisms for pond start and regular addition for correct balance

SUREPOND — neutralises chlorine and reduces stress on fish

WHITESPOT — remedy for protozoan parasites

FIN-ROT — remedy for bacteria skin and gill flukes

FUNGUS — remedy for fungus on fins and body



CLEARGILLS — rapid de-congestant for fish with heavy mucous and gill infections — double action anti-bacterial

KOIVITS — unique spray — allows direct application to daily food ration — boosts appetite and improves general condition of all fish



NT LABORATORIES
EAST PECKHAM
KENT TN12 5HF
TEL 0622 871387



FIRST FOR PONDS



Part of the NewTech range of aquarium and pond additives and Test Kits

KEEPING *and Breeding:*

THE PLUMED BASILISK

It's big and beautiful ... and a bit of a handful. But, follow Robert and Valerie Davies' guidelines and you, too, could end up as a successful keeper and breeder of this impressive lizard

Photographs by the authors



Plumed Basilisk eggs just about to hatch.

BASILISK FACT FILE

Common Name: Plumed Basilisk

Scientific Name: *Basiliscus plumifrons*

Family: Iguanidae

Distribution: 1. The genus is found in Central America, from southern Mexico to Venezuela and Ecuador; 2. *B. plumifrons* is found from Guatemala to Costa Rica

Size: Over 2ft in length (60+ cm)

CAPTIVE CARE

Vivarium Size: 5 x 4 x 4ft (1.5 x 1.2 x 1.2m) minimum, provided with sturdy branches

Lighting: A daylight-type fluorescent tube is recommended

Water: Must be provided at all times

and cleaned regularly

Heating: 82-86°F (28-30°C), during the day; 68°F (20°C) — minimum, during the night

Diet: Insects, including crickets, locusts, waxmoth larvae, earthworms — possibly, also fruit (see text). Supplement with flaked food, catfood, powdered cuttlefish and multi-vitamin powder. Always provide clean water.



Our adult male.

Part of the appeal of reptiles is, undoubtedly, their prehistoric appearance. Watching a monitor with its lumbering gait, powerful head and legs, flicking snake-like tongue and heavy tail, it is not difficult to imagine its larger ancestors. The Three-horned Chameleons equally evoke visions of primitive monsters such as *T-Rex* and *Dinosaurs*.

This prehistoric lineage is also evident in the Plumed Basilisk (*Basiliscus plumifrons*). The head bears a large double crest or casque, and there is a large sailfin-type crest along the back, with a similar one on the tail. Even at their present length of about two-foot-plus (70cm) they are impressive animals; some five or six times larger, they would be truly awesome!

Mythological name

The genus *Basilisk* is part of the Iguanidae family and its members hail from Central America (southern Mexico to Venezuela and Ecuador). The generic name is derived from the Greek, *basiliskos*, a diminutive of *basileus*, 'king' or 'little king'.



Newly-hatched baby. The amber coloured iris can just be detected on the left eye.

In Greek mythology, the Basilisk was a fabulous reptile hatched by a serpent from a cock's egg and it had the ability to kill by its breath or its gaze. The name was probably bestowed on this group of lizards because of their staring eyes. In *B. plumifrons* an amber iris surrounds a darker pupil and gives the impression of an unflinching stare.

Body facts

In its native rainforest habitat (Guatemala to Costa Rica) the Plumed Basilisk is a tree dweller, as its long-clawed toes denote. Similar feet are seen in Green Iguana, Water Dragons and various other arboreal lizards. They all usually live in close proximity to water and are excellent swimmers, not hesitating to enter the water to escape attackers.

The toes have slightly webbed margins, a feature which helps them to run on the water surface for reputed distances of up to 400 metres at speeds up to 10 or 12 km/hr. This phenomenon will not be seen in a vivarium, of course, but may be seen if the creature escapes and takes off across a room, as we have witnessed!

The tail is long and powerful — typical of the Iguanidae and, as in many arboreal lizards, the coloration is green, although other species are brownish.

Wild specimens also possess bluish spots or patches on the body. In captive-bred specimens, the green is not as intense, and the blue spots may be paler or absent. There tends also to be a reduction in the size of the crests.

CAPTIVE CARE

Wild-caught specimens are often available but will frequently have damaged snouts caused by hurling themselves at the glass of their vivarium. Captive-bred specimens make far better subjects, but even these can be 'skittish' for a while, until they gradually become tame.

Wild adults seldom calm down and will usually thrash about with claws and tail if handled; they are also capable of a powerful bite. If purchasing wild Basilisks, choose young ones which may adapt better to captivity.

1 Housing

Such large active lizards need a proportionately large vivarium and should not be considered, unless this can be

Our female showing the brown scars of mating on the nape of her neck.



Two-month-old juvenile with a slightly deformed tail.

provided. At the very least, the vivarium should be 5ft (1.5m) x 4ft (1.2m) x 4ft (1.2m) high, much larger if possible. The ideal situation would be if part of a room could be partitioned off to provide a spacious home.

We have seen these lizards 'at liberty' in a heated cellar which was furnished with branches and shrubs, a good-sized artificial pond and illuminated with spotlights and fluorescent tubes. Basilisks lived quite happily with various other lizards of similar size, but for most people this is the stuff dreams are made of.

A water container must be provided, as these lizards usually like to bathe. For small specimens, a puppy litter tray with 3in (8cm) water will suffice, but larger specimens will need a large plant tray or similar. A degree of humidity is also necessary; this can be provided by several inches of a moisture-retentive substrate covered by a good layer of moss, the whole thing being kept humid by daily spraying.

Basilisks will often defaecate in the water but the pair we had (see Footnote) seldom entered the water at all and tended to defaecate on the moss. Wherever they decide to perform their functions, cleanliness is essential. Water and moss must be changed when fouled. Cleaning out the whole vivarium is one of the seven labours of Hercules, but must be done when necessary.

Sturdy branches (non-resinous) must be provided for climbing, and if plants can be included, the appearance of the cage is improved. However, plants are easily broken and the leaves usually develop dozens of fine perforations from the animals' claws. This will ultimately cause the death of the plants, which must then be renewed. Rather than a bare vivarium, a few plastic plants, especially the trailing type, could be fixed at various points.

The vivarium must be constructed from materials which will withstand the humid atmosphere and moist substrate.

Exterior plywood with several coats of yacht varnish can be used. Another possibility is plastic laminate fastened to a wooden frame with all joints sealed with silicone sealer.

Ventilation panels are necessary to allow some movement of air. A deep baffle board at the front may help to stop scabbaling at the glass if necessary.

Heat can be provided by a thermostatically controlled spotlight or heater-plate (the wattage must be adequate for the volume of the vivarium). Basilisks must be able to bask and will utilise a branch situated below the heat source.

For lighting, Trulite fluorescent tubes are ideal, as they help with the synthesis of Vitamin D3. A daytime temperature of 82°F to 86°F (28°C to 30°C) is suitable but, at night, the temperature should not drop below 68°F (20°C). Night temperatures can usually be maintained by an alternative heating system such as a soil cable (or thermostat) or, if using a heater plate, a thermostat which has day and night settings. The lights must, obviously, go off at night.

2 Feeding

In the wild, Basilisks will feed on insects and other arthropods, snails, fish, smaller lizards and, possibly, small mammals or nesting birds. It is often stated that they will also eat some fruit, but our specimens never did so.

In captivity, they will accept the usual reptile fare of crickets, locusts, waxmoth larvae etc. Earthworms are readily eaten but must be kept for two or three days in clean moss to allow them to empty their gut contents. Our female would always snap up woodlice.

Crickets and other insects should have their nutritional value boosted by feeding them on fish flake food, cat food, powdered cuttlefish bone etc. prior to giving them to the lizards. The food must be 'fortified' by dusting with multi-vitamin powder. Growing young and females need substantial amounts of calcium which can be supplied by further dusting the food with powdered cuttlefish bone.

A large glazed dog bowl with an incurved rim was also provided, into which were placed the various insects (chilled to prevent rapid escape). The bowl also contained small pieces of cuttlefish bone which the lizards ate readily.

A water bowl was provided but our pair never drank from it, preferring to drink from the 'pond' — all the more reason for daily water changes.

3 Breeding

Under such a regime, the captive-bred babies we originally bought grew steadily but did not attain the size of wild ones; this would seem to be common in many captive-bred animals. As they matured, we noticed several attempts at mating.

Basilisks are easy to sex because of the males' crests. Females are smaller than males and mating can be quite a violent affair. The male will nod vigorously at the female and, without much ado, will seize her behind the neck, usually tearing the skin. This does not seem to harm her, since the tear quickly heals over, although if there are any signs of infection developing, an antibiotic ointment will be needed. However, this is seldom the case.

Having seized the female, the male twists his cloaca round and inserts one or other of the hemipenes into the female's cloaca. Due to there being several matings, it is difficult to be precise, but we estimate the gestation period to be roughly 30-32 days.

Our female was observed digging one evening but no eggs were found. After four trial digs, she finally laid four eggs some eight inches (20cm) deep in the corner of the vivarium. These proved to be infertile, but four more were laid in her next clutch a few weeks later. Some authors give 20 eggs as the maximum. Females can, reputedly, produce several clutches a year, although it would be better to give her a rest after one or two clutches.

We placed the eggs in a clear, plastic container with three inches (8cm) of moist Vermiculite (equal weights of water and Vermiculite). Five small holes were drilled at each end and close to the top. The eggs were placed on the Vermiculite, photographed, and further Vermiculite added to leave roughly one third of the eggs' surface exposed.

The eggs were checked frequently, any which were badly discoloured or fungused being removed. If the Vermiculite is dry water must be added. This is easily checked by weighing the container and checking against the original weight.

After incubating the eggs for 71 days at 80°F (27°C), they finally hatched. The time taken to hatch varied between four and five hours. On emerging, the young measured 4cm (1.6in) snout to vent and 7.5cm (3in) tail. The dorsal surface was dark grey with faint darker markings; the tail was marked with lighter crossbands. The ventral surface was bluish green, which also extended along the lower jaw.

The babies had the characteristic amber eye of the species. Each one also had a small amount of yolk attached, but this broke off as they moved around. They were able to move very quickly indeed. One baby had a slightly deformed tail, but this did not prove to be detrimental.

4 Care of the young

The young were removed to a 24in (60cm) x 12in (30cm) x 12in (30cm) vivarium containing several layers of newspaper and clumps of moss. A piece of cork bark was provided for shelter and a few twigs were supplied for climbing.

The vivarium was sprayed to give moderate humidity and was kept at 80°F (27°C) day, 68°F (20°C) night. A small dish of water was also supplied.

First foods were crickets and waxmoth larvae. Vitamin and calcium supplements

were provided and an 18in (45cm) Trulite tube was fitted so they could bask near to it. In time, the young needed to be removed to larger vivaria as they grew, of course.

Special plea

Basilisks are fascinating creatures which are not impossible to breed in captivity, providing the right conditions can be maintained. Since these popular lizards are still taken from the wild, captive breeding on a reasonable scale would reduce pressure on wild populations.

However, here we would make a plea to prospective owners not to keep these large, active reptiles in accommodation which is too small. To do so would be cruel.

Footnote

As with all egg-laying reptiles, there is a danger of egg retention, a fate which eventually befell our female. Because of the space their vivarium occupied, the male was donated to the Lakeland Wildlife Oasis in Cumbria, where he is thriving in a huge enclosure. There, he delights parties of school children and other visitors because he is tame enough to be touched while held by the owner, and is eagerly awaiting a captive-bred mate.

**ISLE OF WIGHT
AQUATIC
EXPERIENCE.**
INCORPORATING -
Grocklemania

at

**WHITECLIFF BAY HOLIDAY PARK
BEMBRIDGE · ISLE OF WIGHT**

Plus all the facilities of
Whitecliff Bay Holiday
Park, and dozens of places
to visit on the Island.

**ON FRIDAY 22nd to
SUNDAY 24TH APRIL '94**

Join us and our loyal regulars for a weekend of fishkeeping fun on our lovely Island, and enjoy the unique atmosphere of "GROCKLEMANIA"

Our thanks to our major sponsor

For their help and commitment given to our hobby.

TARIFF			
Room	Breakfast	Half board	Full board
STAY LOUNGE	10.00	12.00	14.00

Tariff A includes accommodation in hotel, with catering (dinner on Friday and Saturday nights, Dinner, Breakfast and Lunch on both nights, buffet meal on Sunday night, and use of all other Holiday Park facilities (except the Bath & Sauna, for which a small charge will be made).

Tariff B includes all the above, plus return motor vehicle/Car Ferry bookings for your car and up to 3 passengers.

TO BOOK
PAUL FORBETT, THE ORCHARD,
GALTONS, ISLE OF WIGHT, PO36 3EP
Telephone: (0985) 72246 evenings

KAROBAR KOI
SUPPLIERS OF HIGH GRADE JAPANESE KOI
4" - 25" AT COMPETITIVE PRICES

PHOENIX 2000 KOI FOOD BY MAIL ORDER OR COLLECT CARRIAGE FREE
1kg = £7.50; 5kg = £27.50; 10kg = £45.00; 20kg = £74.00
3mm, 4.5mm, 6mm, 8mm, PLEASE STATE SIZE WHEN ORDERING

PRO KOI FOODS MAIL ORDER OR COLLECT CARRIAGE FREE
5kg = £26.00; 10kg = £46.00; 20kg = £86.00; 40kg = £166.00
PLEASE STATE SIZE OF PELLET - 5mm or 8mm
ALSO PROKIX UNIVERSAL DIFFUSER £45; TURBO CONVERSION KIT EST. COMPLETE TURBO DRUM £120

20 watt ULTRA VIOLET £79; 15 watt ULTRA VIOLET £57; 8 watt ULTRA VIOLET £41; 4in BOTTOM DRUM £40; 4in TANK OR LINER CONNECTOR £8.50; FILTER MEDIA SUPPORTS 26in x 15in £4.25; 15 x 8in BLACK FILTER BRUSHES £2.90; FILTER MEDIA BAGS £.40p each
WHY NOT SEND FOR MORE DETAILED LIST OR PHONE

**MARCH 1 TO OCTOBER 30 OPENING TUESDAY TO SUNDAY
CLOSED MONDAYS EXCEPT BANK HOLIDAYS 9.30 am to 6 pm**

COVERED SALES AREA

**62 BUCKNALLS DRIVE, BRICKET WOOD, ST ALBANS, HERTS.
PHONE OR FAX 0923 677734**

Improved purity

One must be careful not to infer that the heading implies previous products were sub-standard in any way, but there is no other attention-grabbing phrase that will adequately describe the new filters from **PURITY ON TAP**.

Recent results from prolonged research at Loughborough University have provided valuable insight into just how filtration works. Balancing the priorities of removing proportionate amounts of dissolved wastes against particulate (suspended) matter is but one important factor, especially where 'metals' are involved. Pore size relative to granular particle size of carbon medium is another ('short travel' is a term to look out for).

Much of this know-how has been built into the two new filters whose performances now out-strip earlier estimates.

Suitable for ponds of 2,500 gallons upwards, the KP2 SUPER filter is a three-pod, colour-coded system conveniently mounted on a wall bracket 18in long.

WATER'S EDGE

BY DICK MILLS



PURITY ON TAP

The first pod is a 'Sedex' commercial 'absolute' rated pre-filter and although the housing is transparent (for regular eye-balling maintenance checks), this may be shielded if required to guard against algal growth

occurring. The subsequent pods contain 'short travel' carbon media beds. Running costs are around £1.36 per thousand gallons.

The HILUX filter is designed for water changes at fast flows in high contaminant areas. The twin pod system comprises a Sedex pre-filter and a 'short travel' carbon media filled second pod features an effective life gauge. Running costs are around 0.40p per thousand gallons.

Both filters remove a broad range of 'metals' pesticides and other pollutants.

Purity on Tap have been awarded the 'Water Byelaws Scheme-Approved Product' seal of approval by the Water Research Centre.

Details from all retail outlets, or from: **PURITY ON TAP LIMITED**, Wickfield Farmhouse, Shefford Woodlands, Newbury, Berkshire RG16 7AL. Tel: 0488 648319; Fax: 0488 648997.

Then, the two filters differ considerably; the Biotic 5 model (suitable for ponds up to 800 gallons) has a layer of BIOTIC ROCK, for microporous, anaerobic de-nitrification (converting nitrates back to free nitrogen) sandwiched between the Bio-plus, and is a self-contained unit. The Biotic 7 (suitable for ponds up to 1200 gallons) is a two chamber filter and the main denitrification process occurs in the second chamber.

A comprehensive leaflet explaining the whole filtration principle is obtainable from: **CRYSTAL CLEAR**, Regan Works, Halliwell, Bolton, Lancs BL1 8AR. Tel: 0204 842801; Fax: 0204 849499.

Water answers

'Healthy Water Means Healthy Fish' is a motto we could all adopt, but **STAR FISHERIES** thought of it first to launch their new campaign to create more awareness among aquarists of fishkeeping problems caused by poor water quality. As UK distributors for the American giant **ARGENT CHEMICAL LABORATORIES**, Star Fisheries have released a collection of water health products.



STAR FISHERIES SUPPLEMENT

A.B.A. is a blend of seven essential bacteria needed for efficient filtration.

ARGENESIS will remove chlorine and detoxify ammonia.

HARMONY will reduce stress in fish by buffering pH and detoxifying heavy minerals.

PARACIDE GREEN is a general purpose medicant.

All four products are developed for professional use in both fresh and salt water, available in sizes from 30ml to 4litres. Your dealer will have the products, and access to a special **Star Fisheries Help Hotline** will ensure that you will be given the best advice and support at all times.

Details from: **STAR FISHERIES**, 94a Benhill Road, Sutton, Surrey SM1 3RX. Tel: 081 643 8162; Fax: 081 643 8166.

Complete filters

The word 'complete' is necessary for it denotes a fullness of operation, rather than a list of components. The **BIOTIC 5** and **BIOTIC 7 POND FILTERS** from **CRYSTAL CLEAR** have been designed to give a complete biological water purification process, rather than stop at the nitrate stage.

Both utilise a 'Fragmentator' at the input stage instead of a spraybar to break up debris for optimum trapping in the initial brush. Successive layers of **BIO-PADS** and **BIO-PLUS** follow physically to trap finer debris and subsequently biologically filter the water, firstly by nitrifying bacteria.

NT Products for '94

Even though these columns try to keep you in touch with all the latest product developments, it came as a bit of a surprise to realise just how many **NEW TECHNOLOGY** products there are.

There are over 10 in the **AQUA TEST KIT** range, all helping to prevent illnesses breaking out by monitoring the water conditions effectively and easily. The latest addition is the **OXYGEN TEST KIT** available by the time you read this.

The **NEW WAVE AQUARIUM RANGE** boasts twelve products, now presented with free integral dosing beakers (10-50ml in 10ml levels), while the **MARINE MULTI-PLUS** supplement still comes in the traditional double stoppered flask (first introduced by New Technology in 1984).

The innovative **SPRAYDECOR** aerosol makes 'instant' rockwork both variable and fun to make and is a completely inert substance as a matter of course.

The range of filter media is no less impressive:

- AQUA-ZORB** — ammonia remover
- ULTRA-ZORB** — nitrate/phosphate/ammonia remover
- PHOSPHA-ZORB** — phosphate remover from marine and freshwater aquaria and ponds
- ANI-REZ** and **CAT-REZ** — de-ionising resins for Discus keepers and marnists; Cat-rez is also available with an indicator that shows when re-charging is necessary.
- NITREZ** — nitrate removing resin for tapwater
- SOFTREZ** — water softener and pH reducing resin for freshwater aquaria
- SUPERCARB** — phosphate-free carbon filter medium

Details from: **NEW TECHNOLOGIES LABORATORIES LTD.**, Unit 13, Brandbridges Industrial Estate, East Peckham, Tonbridge, Kent TN12 5HF. Tel: 0622 871387; Fax: 0622 872331.

KEEPING

The Fork-tailed Catfish

Andy Stratton of the Catfish Association of Great Britain introduces a naked species from torrent streams which does well in aquaria.

Photographs by the author

FORK-TAIL FACT FILE

The genus *Amblyceps* contains only one species, *Amblyceps mangoi*. This genus belongs to the family Amblycipitidae (the Torrent Catfishes) along with one other genus, *Liobagrus*. In total, there are only five species in the family.

Distribution

Wide range, throughout India, Burma, Thailand, West Pakistan and the Malaysian Peninsula.

Size

Up to 120mm (4.7in) Standard length (ie — from snout to base of tail), remaining smaller in aquarium.

FIVE MAINTENANCE TIPS

- 1 Cool water: 68 to 74°F (20-23°C)
- 2 pH range between 7.2 to 7.5
- 3 Regular water changes to keep water fresh and bright
- 4 Regular raking of substrate
- 5 Subdued lighting to allow you to watch your fish closely

GLOSSARY

Mandibular barbels: lower lip barbels
Maxillary barbels: upper lip barbels
Nasal barbels: snout barbels
Caudal fin: Tail fin
Subcutaneous: under the skin (covered)



The aptly named fork-tailed catfish.

There can be few freshwater habitats that catfishes have been unable to make a home in. Their great diversity has allowed them to cope with anything nature has to offer. One small Asian species that has more than most to cope with is *Amblyceps mangoi*, the Fork-tailed Catfish.

Living in small hill-streams where the water is clear, cool and highly oxygenated, the Fork-tail makes its home among the rocks and pebbles that litter the bottom, where it feeds on aquatic insects and larvae.

These small streams can become raging

torrents after rain, but during dry spells, they often break up into small pools.

Faced with having to cope with these extremes of condition over aeons of time, '*Amblyceps*' has evolved some very special anatomical features and behaviour.

Survival methods

The Fork-tailed Catfish is able to regulate the flow of water entering the gill chamber by the use of a fold of skin situated behind the gill opening. This fold also allows a fish to suspend its breathing,



various barbels are clearly visible in this shot (text for details).

ring which time a quantity of fully oxygenated water is probably gained within the chamber where absorption of oxygen is carried out. An added ability to bury itself so helps this species to survive both flood and drought.

During a flood, living under the substrate obviously stops you from being swept away, while during dry spells, lifesaving moisture may still be present under the gravel.

It is also thought that as long as oxygenation of the blood can be effected through the skin.

General features

Amblyceps mangoi is covered in thick skin which extends over the fins, apart from the caudal. This fin is large and deeply forked, hence the common name, Fork-tailed Catfish. In some specimens, a filamentous extension may be found on the upper lobe of the tail.

Around the mouth, there are four pairs of barbels that are held out stiffly. One pair is nasal, another maxillary and two are mandibular (see Glossary). All the barbels are 'normal' and are therefore not much longer than the head. The eyes are small and subcutaneous and the body is muscular and eel-like.

Suitable Tankmates

All the fish listed below will enjoy the same conditions as 'Amblyceps', and are often available.

Common Name	Scientific Name
Giant Danio	<i>Danio aequipinnatus</i>
Pearl Danio	<i>Brachydanio albolineatus</i>
Zebra Danio	<i>Brachydanio rerio</i>
Hi-spot Rasbora	<i>Rasbora dorsiocellata</i>
Long-band Rasbora	<i>Rasbora einthoveni</i>
Red-line Rasbora	<i>Rasbora pauciperforata</i>
Chola Barb	<i>Barbus chola</i>
Dwarf Barb	<i>Barbus polius</i>
Pygmy Barb	<i>Barbus phutunio</i>
Flying Fox	<i>Epplatyrhynchus kalopterus</i>
Hong Kong Plec	<i>Pseudogastromyzon spp</i>

Aquarium design

The Fork-tail would struggle to survive in the average community aquarium, but with what we know of their natural habitat, and with a little imagination, an aquarium can be set up to house these fish and allow other 'non-catfish' to be kept with them.

As with most species of catfish, floor space is more important than height within the aquarium; an extra 75mm to 100mm (3-4in) width will allow them more space and allow you extra room for aquascaping.

As 'Amblyceps' will, at times, bury itself, an ideal substrate will be silica sand or fine smooth gravel. Smooth-sided rocks can be used, along with slate, to construct hiding places; lengths of plastic pipe can also be used.

Power filters, either internal or external, can be used in the aquarium. The returning water should be sprayed onto the surface of the water to break it up as much as possible, thus aiding oxygenation.

Foods and feeding

Dry foods will be accepted, but live foods are much preferred. Tubifex and white worms being strong favourites. When food is added to the aquarium, the fish will rush from cover almost immediately and madly dash around the substrate until food is found.

It will then be eaten greedily, often on the move; this frantic feeding behaviour is probably due to the fact that in their natural habitat, these fish have little time to grab food before it is swept away.

Breeding

I have not been able to see any sexual differences on my nine fish, but I believe that females remain much smaller than males.

I have not heard of any reports of this species breeding in aquaria, or seen any reports of spawning behaviour in the wild. I would, however, guess that a small number of large sticky eggs are laid under cover, with the fry staying there waiting for food to be swept to them.

Is your tap water suitable for fishkeeping?

Safe-guard Dechlorinator

"Simply" converts NEW tap water to a quality acceptable for fish keeping

Use **Safe-guard** first when new tap water is added to tanks or ponds

King British Fish foods & Water treatments

"The perfect combination for those who just want to do it better"

On sale at Aquatic shops, Garden centres and Pet stores



Requirements lifted

From July 1994, **Movement Certificates** previously required when moving fish within Europe, and **DOF 15 Import Documents** (required when fish are imported into the EU) will no longer be required for "ornamental fish kept permanently in aquaria".

The news was announced by MAFF speaker **Christine Baxter** at the AGM of **Ornamental Fish Industry (UK)**. The organisation is now in consultation with MAFF

to determine which species will still require Movement Certificates and DOF Forms.

OFI (UK) Chief executive **Keith Davenport** explained that it is evident that large numbers of imports of traditional tropical fish will no longer require those documents: "This move will save our members time and money, as some countries charge for these documents to be completed."

The Department of the Environment has also consulted OFI (UK) on the trade in CITES (Convention on the International Trade in Endangered Species) listed species, and the organisation has been asked to comment on the process by which import permits are obtained.

Remarking on this, Keith Davenport says, "This approach reflects the good co-operation which exists between regulatory authorities and OFI (UK). It is extremely important that, at a time when legislation covering the import of wildlife is being considered in general, the views of our members are being heard."

Interpet appointment

Aquatic and pet product manufacturer **Interpet** has appointed **David Palmer** as sales and marketing director. David began his career with Nestlé and has over 20 years' experience in the marketing



industry. "David's experience will be invaluable to Interpet," commented chairman **Dr Neville Carrington**. "He will be developing our marketing function and leading the sales drive to bring our expanding product range to the market. As a result, the company, our customers, and the public will all benefit."

"Report incidents" urges HSA

The **Health and Safety Executive (HSE)** has published a leaflet aimed at encouraging people to report incidents involving pesticides and veterinary medicines, including aquatic medications and foodstuffs.

The leaflet, entitled **Pesticides and Veterinary Medicines**, is available free from HSE Books, and explains that incidents occur where people, animals, or the environment have been harmed by pesticides or veterinary medicines. It also sets out how to go about reporting such incidents.

Dr Tim Carter, director of field operations and medical services for HSE, explained: "Pesticides and veterinary medicines are powerful products — they need to be in order to be effective, and that is why we have proper systems for assessing their safety and controlling them."

"We have had reports such as toddlers getting into garden sheds and reaching bottles which should be kept out of reach, as well as reports of spills in rivers, with suspected harm to fish and other wildlife."

"Information from the public can actually influence what is sold and what conditions of use should be made to apply. Better reporting means safer use of products and fewer incidents in the long run."

Copies of **Pesticides and Veterinary Medicines — Reporting Incidents** is available free from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS. Tel: 0787 881165; Fax: 0787 313995.

Open Star Weekend

No fewer than 237 aquatic suppliers from throughout the UK, as well as a retailer from France, visited coldwater fish specialists **Star Fisheries** to view over 200,000 top quality Chinese Fancy Goldfish during

their recent open weekend.

The event was the culmination of a six-week buying trip to China by **Star Fisheries**. Eighty-nine different varieties were on display, some for the first time in the UK, and marketing director **Tam Meechan** was delighted with the response.

'Triple Gold' at King British



Keith Barraclough (second from right) with **King British** award winners **Gordon Holmes** (shaking hands), **Michael Cole** (left) and **Brian Simpson**.

Three **King British** employees have received long-service awards from the company. **Michael Cole**, **Gordon Holmes** and **Brian Simpson** each received a gold watch to commemorate 25 years' service to the company.

Michael was recently appointed to the board of **King British** associate company **Barraclough's Fish and Aquarium Supplies**, as customer service director, while Gordon is technical director and Brian is processing and export packing manager.

Presenting the awards at a special champagne reception, managing director **Keith Barraclough** remarked: "This is not a case of simply giving gold watches to three men who have completed 25 years' service. Each of these people has given total commitment, and their drive has helped to shape the team which has made **King British** and **Barraclough's Fish and Aquarium Supplies** the great success they are today."

First PTIA conference

The first annual conference of the **Pet Trade and Industry Association (PTIA)** has been organised for 20-21 March at the **Moat House Hotel, Stratford-upon-Avon**.

A wide range of subjects will be covered by the conference, including trends in the pet trade industry, responsible pet ownership, improving shops and shop security, as well as raising industry standards, legislation, and European perspectives.

Rates are £105 per head for the whole conference. This includes lunch, coffee, accommodation and cabaret; the day delegate rate is £32 per head and includes lunch and coffee.

For more information contact **PTIA, Bedford Business Centre, 170 Mile Road, Bedford MK42 9TW**. Tel: 0234 273933. Fax: 0234 273550.

Second Chester Convention

The Association of Aquarists (A of A) and the Federation of Northern Aquarium Societies (FNAS) are to present their second joint convention at Chester Zoo (Saturday 12 March).

Among the attractions of the event is a 65-minute video on aquatic plants, produced by A of A's most senior plant judge **Ron Forde** and, according to the A of A, demonstrates that the Brits are every bit as good as the Dutch in growing plants and producing beautiful furnished aquaria.

Brian Walsh of FNAS will be making an audio-visual presentation on the need for conservation in the habitats of aquarium fishes; while **Lynn Ferne**, secretary of the British Cichlid Association (BCA) will be talking about Cichlids from Lake Tanganyika, partly illustrated with slides taken by cichlid authority and frequent *A&P* contributor **Mary Bailey**.

Dr Gordon McGregor Reid, curator-in-chief at Chester Zoo, will then show slides of his work in the Korup rainforest of the Republic of Cameroon, West Africa.

Tickets to the event are priced at £5.00 for advance booking (£7.50 at the door); the fee includes free lunchtime entry to the zoo and aquarium.

Booking and information from **Nigel Aymer**, 23 Scardale, Heelands, Milton Keynes, Bucks.

Ruby for Basingstoke

Basingstoke & DAS celebrates its 40th anniversary with a special Ruby Anniversary evening at Wote Street Social

DIARY DATES

Monday 7 March

Potteries & DAS Catfish & Cichlid Group — Auction, Heron Cross Sports and Social Club, Heron Cross, Stoke-on-Trent. Booking in: 10.30 am-12 noon. For details, ring 0782 331598.

Thursday 10 March

Midland Aquarists and Pondkeepers Association (MAPS) — Meeting (7.30pm), Ullesthorpe Garden and Aquatic Centre, Ullesthorpe, near Lutterworth, Leicestershire. Main speaker: **Berti Gesting** (BioPlast UK). Details: **Keith Watson**, 39 St Marks Court, Pool Close, Rugby, Warwickshire CV22 7RW. Tel: 0455 202144 (daytime) or 0788 811587 (evenings).

SOCIETY WORLD

Club, Basingstoke, on **Friday 18 March** (8.00 pm).

Former members and friends of the society are invited to attend. Details and to assist with numbers for catering arrangements: **Chris and Julie Ralph**, 610 Abbey Road, Basingstoke RG24 9E. Tel: 0256 63220.

Chester Marine Seminar

Dr Gordon McGregor Reid will also be speaking at the **International Marine Aquarists Association (IMAA) Marine '94** seminar, also at Chester (**Sunday 20 March**). His subject will be *The Role of Zoos in Aquatic Conservation*. Other speakers: **Chick Holland**, of Lahaina Aquarium Systems, who will present a talk on Reef Systems and Filtration, and marine consultant **Les Holliday** whose subject will be *Natural Reefs*. Tickets for the seminar also provide access to the zoo (first 100 to book in advance are to be given a guided behind-the-scenes tour). A percentage of funds raised on the day will be donated to the zoo's aquarium adoption scheme.

Tickets booked in advance are £5.00 for IMAA members and £7.00 for non-members. Children under 12 and OAPs are £3.00; while a single price of £4.00 is set for spouses who wish only to visit the zoo; this must be booked in advance.

Further information: **Colin Grist**, 41 Redcliffe Street, Cheddar, Somerset BS27 3PA. Tel/Fax: 0761 411582 (daytime) or 0934 744914 (evenings).

FBAS News

Bill Rundle has been elected President of the **Federation of British Aquatic Societies (FBAS)**. Bill, an active member of Plymouth AS, was elected unanimously at the Federation's AGM.

The posts of Advertising Officer and Society Support Officer were filled by **Bob Lemmon** and **Paul Corbett** respectively, following their co-option to the council last year. Bob has already expanded the Federation's dealer discount scheme for societies, while Paul has collated a number of show dates for the coming year.

Paul's services are open to any society holding or intending to

Sunday 13 March
Chwyd Aquatic Show Team — Auction, Boys Brigade Hall, Castle Street, Caerparle, Wrexham, Chwyd. Booking in: 11 am-1.00 pm. Hot and cold refreshments available. For details and advance booking: **Peter Jones**, Tel: 0978 761829; or details only: **Frank Cobb**, Tel: 0925 413938.

Sunday 20 March
OASIS (Ordinary Aquarists Society in Sunderland) — Auction, Thompson Park Community Centre, Monkwearmouth, Sunderland. Details: **Mrs Avril Banks**, 122 Moor Crescent, Gilesgate Moor, Durham DH1 1DL. Tel: 091 384 1433.

Taylor Aquarist Club — Annual Open Show, Taylor High School, New Stevenson, Motherwell. Fish entries: 10am; Open to public: 1pm.

Details: **Maira McAlorum**, c/o Taylor High School, Carlin Street, New Stevenson, Motherwell ML1 4JP. Tel: 0698 832219 or 0698 253252 (after 4pm).

Sunday 10 April
Kirkcaldy AS — Open Show and Auction, Balwearie School, Balwearie Gardens, Kirkcaldy. Benching: 9.30 am; Auction: 1pm. Details: **R. Gold**, Viola Cottage, 30 Hawthorn Street, Leven, Fife KY8 4QE. Tel: 0333 425103.

Northampton & DAS — Annual Open Show, Gladstone Lower School, Streetfield Road, off Gladstone Road, Northampton. Information: **Mrs Debbie Woodman**, Tel: 0604 411591.

Sunday 17 April
Hallon AS — 23rd Annual Open Show, Dilton Community and Youth Centre, Dundalk Road, Widney.

hold an Open Show, and prevents avoidable clashes of show dates. For information, contact **Paul Corbett**, The Orchard, Gatcombe, Isle of Wight PO30 3EF. Tel: 0983 721246 (evenings).

AMGK Calendar

The 1994 calendar for the **Association of Midland Goldfish Keepers (AMGK)** kicks off this month with their first meeting on **Sunday 13 March**.

Meetings are held at Foleshill Community Centre, Foleshill Road, Coventry, starting at 2.00 pm and finishing at around 5.30 pm.

The full calendar is:
Sunday 13 March — opening meeting of the season;
Sunday 15 May — Adult Fish Show;
Sunday 26 June — Open Show;
Sunday 31 July — Pretty Fish Show;
Sunday 18 September — Baby Fish Show;
Sunday 6 November — AGM.

Further details from membership secretary **Mrs Anne Bloor**, 10 Barnett Crescent, Woodford Halse, Daventry, Northants N11 3SP. Tel: 0327 61198.

New WASP venue

Washington Aquarist Society and Pondkeepers (WASP) has a new venue: Stella Maria Social Club, Albany, Washington, Tyne and Wear.

New members are always welcome. Further details can be obtained from secretary, **Dawn Hunter**, Blue House South, Blue House Lane, Washington, Tyne and Wear NE37 1AN. Tel: 091 415 4275.

Cheshire, Benching: 11.30 am — 1pm. Auction: 1pm prompt. Details: **P.H.J. Dixon**, 31 Eilon Avenue, Rainhill, Merseyside. Tel: 051 426 6689.

Strood AS — Open Show, Cliffe Memorial Hall, Cliffe, Kent. Details: **John Pell**, 44 Lakeswood Drive, Wigmore, Gillingham, Kent ME8 0NS. Tel: 0634 389362.

Friday to Sunday 22-24 April
Isle of Wight AS — **Grocklemania**
A tableau class will be included in this year's **Grocklemania**. Rules will be different to those governing BAF, in that fish and furnished tanks exhibited in the tableau will not form part of the individual show classes. Details of Open Show, lectures, demonstrations, trade stands accommodation and bookings: **Paul Corbett**, The Orchard, Gatcombe, Isle of Wight PO30 3EF. Tel: 0983 721246 (evenings).



▲ The appropriately named Violet Squirrelfish (*Sargocentrus violaceum*).
The Longspine Squirrelfish (*Holocentrus rufus*) in its pale-colored state.

Anyone who has studied the populations of coral reefs not only by day, but also at dusk or during the night, will have discovered that there are a number of creatures which are rarely or never to be seen by day, becoming active only with the onset of darkness. At the same time, almost all species which swim or creep around in search of food during the daytime go into hiding at nightfall.

Especially striking is the fact that many invertebrates hide by day and first put in an appearance at dusk. In particular, snails, crabs and lobsters, as well as starfishes, brittle and basket stars, leave their hiding places at this time to go feeding. Only at night do most sea anemones and corals expand their tentacles to their maximum extent. A further example is the Banded Coral Shrimp (*Stenopus hispidus*), which lives in pairs and can be found only with great difficulty during the day, but can be seen at dawn and dusk at the entrances to their hiding places.

This nocturnal variation in the reef population involves not just invertebrates; there are also innumerable fishes which shun the light of the sun and remain hidden by day in holes and cracks in the reef. These are predominantly predators which hunt during the hours of dusk and darkness. They include Morays (Muraenidae), many Groupers (Serranidae), Scorpion Fishes (Scorpaenidae), Big-eyes (Priacanthidae), Soldier and Squirrel fishes (Holocentridae), and many Snappers (Lutjanidae). When it comes to smaller nocturnal species, Cardinal Perch (Apogonidae) predominate.

Identity parade

Of these, I will examine the Soldier and Squirrelfishes in more detail in this article. Both belong to the family Holocentridae which is included in the Order Beryciformes (sometimes referred to as Slimy-headed Fishes), which owes its common name to the fact that these fishes have mucus cavities under the skin of the head. Nowadays the Slimy-headed Fishes are regarded as the forerunners of the Perches (Perciformes), and are probably evolved from primitive herring-like ancestors. They constitute a group of relatively primitive fishes, which formerly included far more species than is currently the case.

SQUIRRELS AND SOLDIERS of the Coral Reef

Frank de Graaf, Emeritus Curator of the Artis Aquarium in Amsterdam, introduces the many charms of two groups of attractive twilight fishes for the roomy tropical marine aquarium

Photographs: Arend van den Nieuwenhuizen. Text translated by Mary Bailey

The majority of Beryciform species live at greater depths than the Soldier and Squirrelfishes, which are found in relatively shallow water and are therefore most at home on the coral reefs of the tropical seas.

The family Holocentridae includes two subfamilies: the Holocentrinae (Squirrelfishes) and the Myripristinae (Soldierfishes). The Squirrelfishes probably owe their name to the striped pattern seen in many species, which is reminiscent of certain North American squirrels. Soldierfishes, on the other hand, are undoubtedly



The Russet Squirrelfish (*S. rubrum*) has attractive longitudinal white stripes on its body.



A beautiful Crown Squirrelfish (*S. diadema*) with fully expanded fins.



The Scarlet-fin Squirrelfish (*S. spiniforum*) has reddish dorsal (back) and caudal (tail) fins, but yellowish anal (belly) and pelvic (hip) ones.

so-named because their shoals habitually swim in regular rows and columns like an army on the march. When inactive they remain concealed in holes.

Squirrelfishes are particularly spiny creatures. As a rule, their dorsal fins contain 11 hard rays, the pectorals one, and the anal four, the second of which is very strongly developed. These creatures also have a long, pointed spine on the cheek at the corner of the operculum (gill cover). The scales are rough and set with tiny spines.

Soldierfishes are somewhat less spiny and lack the spine on the cheek. In all probability, the cheek spines in Squirrelfishes are poisonous (at least, in some species). A prick from them can be extremely painful and sometimes causes local swelling.

Invisible reds

Because of their nocturnal existence, both Soldier and Squirrelfishes have large eyes. The red coloration shared by all



members of the family is likewise related to this lifestyle. Because water acts as a red filter on incident light, red becomes invisible in deeper water, especially in poor light conditions (eg at sunrise and sunset).

Other types of fishes, for example, the numerous small red-coloured Cardinal Perch which inhabit the coral reefs, utilise this circumstance to render themselves more or less invisible. The phenomenon is also encountered in freshwater: in general, red fishes are found in the heavily shaded and often brownish-stained waters of the rain forests.

Overhang dwellers

During the day Squirrel and Soldierfishes hide beneath the overhanging corals of the reef, as well as in grottos, holes and crevices. Soldierfishes are shoaling fishes, but by contrast, Squirrelfishes are normally solitary or found in pairs.

Soldierfishes usually hide away in groups of 10 or more in each cave or hole. They wait there, often in neat ranks or columns, until the approach of darkness. Those specimens near to the ceiling of the hole usually turn belly-up, so that they end up swimming on their backs.

This is a peculiarity seen in many reef fishes: many Emperorfishes, for example, always swim with their underside towards the substrate, regardless of whether this is horizontal, diagonal or vertical. The Royal Gramma (*Gramma loreto*) is likewise known to swim upside down along the ceilings of grottoes and holes.

Nighttime feeders

Although Soldier and Squirrelfishes hide during the hours when the sun is shining brightly, as soon as dusk approaches, they become active and emerge from their hiding places. Soldierfishes swim in relatively open water, where they feed on small fishes, as well as fish larvae and the larger zooplankton.

Squirrelfishes remain close to the bottom and among the corals while searching for food. In doing so, they exhibit territor-

ial behaviour and drive conspecifics from their particular feeding area. In contrast to Soldierfishes, they feed mainly on different types of substrate-dwelling creatures: small crabs, shrimps, molluscs, basket stars, bristleworms, and also small fishes. Crustaceans form the major part of their diet, while fishes are a minority prey item.

Aquarium care

In captivity, the feeding of Squirrel and Soldierfishes presents no problems. As well as shrimps and *Mysis*, they will take all sorts of dead animal tissue, egg mussel meat, deep frozen shrimps, beef heart, earthworms and lugworms. Although they only rarely eat small fishes in the wild state, in captivity we must take care not to house them with small companions as, sooner or later, these are likely to fall prey to the appetites of the Squirrel and Soldierfishes.

Both types are fairly easy to maintain as regards their other requirements as well. It is important, however, to provide dark rooomy hiding places. Although they will, at least, partially abandon their nocturnal lifestyle after a while in our care, to start with, it is essential that they have places in which to hide as, otherwise, they will often refuse to feed.

As well as hiding places, they require plenty of open swimming space. If properly cared for, they can live for more than 15 years in captivity.

Captive breeding

It was possible to make a few observations on reproductive behaviour in the specimens we kept at the Artis Aquarium. The Red Soldierfish (*Myripristis murdjan*) lays its eggs just below the water surface.

Spawning is preceded by foreplay which starts close to the substrate. Both fishes swim around each other in ever-decreasing circles. All of a sudden, male and female rise to the surface, swimming together in a very tight circle, where they abruptly separate after a mutual tail-beat.

At this point, eggs and milt are discharged. The eggs float at the surface with



Note the black coloration on the fins of this Black-banded Soldierfish (*M. adustus*).

the aid of tiny droplets of oil. After each spawning pass, the pair return to the bottom and renew their foreplay.

A group of four *M. murdjan* provided the study material for these observations on pairing behaviour, with just a single pair mating, although the other two individuals now and then tried to join in the spawning ritual. We observed the same type of reproductive behaviour in the Black-banded Soldierfish (*M. adustus*) as well.

In captivity, Squirrelfishes also lay their floating eggs at the water surface.

The breeding behaviour of the Red-striped Squirrel fish (*Sargocentron rubrum*) is almost identical to that described above. The foreplay is the same, except that tail-beating, with the pair in a V or Y formation, takes place at the bottom before the circling. Occasionally, a pair will separate after a single reciprocal tail-beat. It is some time before this behaviour changes to circling.

This tail beating behaviour is also seen in the defence of the territory. A male Red-striped Squirrel fish approaches any intruder in its territory in the same way. If the intruder is another male, or an unripe female, then this behaviour eventually leads to battle and the intruder is driven away.

The larvae of Squirrel and Soldierfishes form part of the plankton and, during their initial growth, have a quite different form to that of their parents. For quite some time, they are elongate and silver-coloured, with a long pointed mouth and spines on the head. Their appearance is so different to that of adults that, at one time, they were assigned to a separate genus *Rhynchichthys*. For this reason, this stage is now known as the 'Rhynchichthys' stage.

As they grow larger they gradually lose the head spines, the snout becomes shorter, and when, at a length of 30mm (1.2in) or more, they adopt a bottom-dwelling existence, they finally resemble their parents.

SQUIRREL & SOLDIERFISH FACT FILE

1 SQUIRRELFISHES

The systematics of Squirrelfishes (subfamily Holocentrinae) have recently undergone rather extensive changes. All species were formerly assigned to a single genus, *Holocentrus*. This now contains just two species, the Longspine Squirrelfish, *H. rufus*, and the Longjaw Squirrelfish, *H. ascensionis*, which are the only members of the family in which the swim bladder contacts the skull.

Those species having a protruding lower jaw, and in which the last dorsal spine is connected to the first soft ray by a membrane, belong to the genus *Neoniphon* (previously *Flammeo*). The Spottfin Squirrelfish, *N. sammara*, and the Blackfin Squirrelfish, *N. opercularis*, are imported now and then.

All other species are now included in the genus *Sargocentron* (formerly *Adioryx*), which is characterised by equal upper and lower jaws, or a somewhat protruding upper jaw, and the possession of a membrane between the last dorsal spine and the first soft ray. All *Sargocentron* species come from the Indian and Pacific Oceans. The most commonly imported species are the Crown Squirrelfish, *S. diadema*, The Horned Squirrelfish, *S. cornutum* (synonym *Adioryx lactoguttatus*), and the Russet Squirrelfish, *S. rubrum*.

The two *Holocentrus* species are found in the Caribbean and the tropical Atlantic. *H. rufus* is restricted to the Caribbean, Bermuda and Florida, and is found in very shallow water. *H. ascensionis* is also known from the eastern tropical Atlantic.

2 SOLDIERFISHES

The subfamily Myripristinae contains, not only the genus *Myripristis*, but also other genera such as *Plectrypops*, *Ostichthys* and *Corniger*, but no representatives of the last two of these have yet been imported for the aquarium trade.

The most commonly imported members of the genus *Myripristis* are *M. murdjan* (the Red Soldierfish), *M. adustus* (the Black-banded Soldierfish) — both from the Indian and Pacific oceans — and *M. jacobus* (the Caribbean Soldierfish) from the Caribbean and the entire tropical Atlantic.

The first two of these can easily attain a length of 30cm (12in), but remain smaller in captivity (up to some 20cm — 10in). *M. jacobus* attains some 20cm (10in) in nature, but remains much smaller in captivity up to about 13cm (5in), and is thus the Soldierfish most suited to smaller aquaria.



The Red Soldierfish (*Myripristes murdjan*) is one of the most commonly seen species.

Delicate eyes

Although, if properly maintained, Squirrel and Soldierfishes present few difficulties in captivity, there is one problem which should be mentioned. Their large eyes are extremely sensitive, particularly so in the case of Soldierfishes, which have rather larger eyes than Squirrelfishes. If, when a move has become necessary, we catch these fishes with a normal hand net, there is always a danger that the eyes will be damaged. Even superficial injuries can lead to inflammation which is very difficult to heal.

An associated problem is that their spines and rough scales can easily catch in the net and be very difficult to free, with attendant damage to the eyes being virtually inevitable. In consequence, it is better not to use a net but to attempt to guide the fish into a submerged plastic or a wide-open polythene bag. In this way, injuries can be completely avoided.

Aquarium territories

Although, in the wild state, territorial Squirrelfishes are very aggressive towards conspecifics, this is rarely a problem in a spacious aquarium. Of course, we should not keep more than a single specimen in a small tank (up to 50cm - 20in) as, otherwise, we are asking for trouble. But, in large aquaria, with plentiful hiding places, several individuals of the same species of Squirrelfish can be kept in perfect harmony. We should, perhaps, make an exception in the case of the Large Squirrelfish (*Sargocentron spiniferum*, synonym *Adioryx spinifer*), which is exceptionally territorial and will not tolerate any conspecific, even in a large aquarium.

Soldierfishes can be kept in small shoals in large aquaria, and there will hardly ever be any sign of aggression among them — as is to be expected in a naturally shoaling species.