

NOVEMBER 1992

AQUARIST & PONDKEEPER

Special features on...

CICHLIDS

Lemon Cichlids — Greedy Oscar — Blue
Dolphins — Humphead Leatacara —
Red Festae



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To Winter**

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RED SEA
HOLIDAY**

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Contents

Features

The Frustrations of a
Fishkeeper — Jason
Endfield's traumatic
introduction to the
world of gourami
keeping 12

COMPETITION WINNERS

How lucky were you in
September's 'Aquarist'
£1,000 'Win an Expert and
His Goldfish' competition?
We have the names of the
first and second prize
winners... and news
of the other 40 18

Worried about how to look
after your pond fish over the
coming months? Make sure
of getting things right by
Looking Forward to Winter
under the guidance
of Peter Skinner 19

Join Sandra Witter as she
rises to meet The
Gulper Goby
Challenge 22

Focus on: CICHLIDS

Fiona Thompson has a
greedy Oscar that once
went A Bite Too Far 41

Great pictures... and great
text... in Breeding the Blue
Dolphin Cichlid from
William Ross 42

The Challenge of the
Lemon Cichlid: Mary
Bailey's experiences with
this beautiful
Tanganyikan species 48



As Alf Stalsberg explains,
the Humphead Laetacara
could well become one
of the small cichlids
of the future 54

It may be big and aggressive,
but Keeping and Breeding
the Red Festae is worth all
the effort. Jeff Challands
can vouch for
that 59

Have you ever asked yourself
the question: What is a Koi?
Well, if you have, Tetra's Dr
David Pool has all the
answers you've been
searching for 74

Visit the amazing Reef
Nurseries of Sri Lanka in
the company of Frank de
Graaf, with outstanding
photography from Arend
van den
Nieuwenhuizen 86

RED SEA HOLIDAY COMPETITION (Part 2)

Your final chance to win
a glorious prize holiday
from Ocean Nutrition
and Underworld
Products, in association
with Aquarist &
Pondkeeper and
Coral World
— Eilat 46

Regulars

Cover Story	3
Editorial:	
Goodbye Quarantine?	4
News Desk	4
Letters	10
Seaview	16
Coldwater Jottings	24
Product Round-up	26
Herpetology Matters	31
Out & About	34 & 83
Your Questions	
Answered	36
Tomorrow's Aquarist	58
Koi Calendar	63
Patently Speaking	65
Naturalist's Notebook	68
Diary Dates	69
News from the Societies	69
What's Your Opinion?	70
Koi Talk	73
Trade Talk	85
Books	89
Next Month	91



COVER STORY — SIAMESE FIGHTING FISH

Photograph: Max Gibbs, Goldfish Bowl, Oxford

Once accepted, names stick. The splendid fish that graces our cover this month is, perhaps, the best example of this. It carries a name that could be said to be 'living in the past'.

Siam — as the name of a country — ceased to be many years ago; it is now Thailand. Yet, we still appear to insist in referring to *Betta splendens* as the Siamese Fighting Fish or Siamese Fighter. Isn't it therefore time that we came right up to date and started referring to this splendid Labyrinthfish as the Thai Fighter?

It would not be the first time that a fish's common name has changed, of course. How many aquarists, for instance, can remember that the Ruby Barb (*Barbus nigrofasciatus*) was known by a different name in the past? And, even if they do, how many new aquarists would be able to recall the actual name without having to check up on it?

Well, whatever we end up calling *B. splendens*, it still commands great and deserved popularity the world over. So, if you are a 'Fighter Fan', stay tuned to *A & P*... we have at least three super *Betta* articles already lined up for 1993.

Editorial

EXPLODING THE MYTH ABOUT SHATTERED TANKS

My telephone line was red hot for about a week prior to the BBC TV's *Watchdog* programme which was screened on 12 October. During the last few hours leading up to the broadcast, it was white hot!

The cause of all the commotion was *Watchdog*'s decision to carry an item on aquaria that shatter, and the consequences of such occurrences. The topic is, of course, a perfectly valid and worthy one, so that, in itself, did not pose a problem. What did pose a problem was the fear that the subject might be treated in a sensationalised, scaremongering and unjustified manner.

What if the programme makers were to pander to the illusionary TV need for a spectacular closing sequence by exploding a tank and screening the whole thing in slow-motion, with water and glass going everywhere?

Some of us were deeply disturbed by this possibility, largely because tanks don't just "explode". They can crack (but rarely do so) and, when/if they do, pour out their contents in next to no time, making a mess and possibly even fusing the house's electrics, but they don't send shards of glass flying all over the room.

Full marks, therefore to OFI (UK) and leading manufacturers such as Clearseal, Seabray, John Allan Aquariums and Interpet, plus some well-informed and concerned aquarists and the FBAS, for their intervention. They applied — through intensive and persistent lobbying — the necessary pressures on the programme makers to modify the content of the item that was eventually screened so that it represented a truer version of what really happens.

Full marks also to the BBC *Watchdog* team for listening and taking note of the advice presented to them by these various

knowledgeable sources. Half marks only to *Watchdog*, though, for apparently taking so long to listen, and for omitting to mention some very important and relevant facts.

They did not, for instance, mention that, when tanks crack, they tend to do so because they have been incorrectly sited, e.g. along, rather than across, floor joists; or on a wobbly or uneven floor; or in draughty halls and rooms near banging doors.

They referred to the non-existence of standards, but omitted to mention the fact that they knew that OFI (UK) has been working on establishing precisely such standards for about a year, and that these will almost certainly be available within the next few weeks.

Low marks, too, for saying that, in the case of baby Stephanie Halwood's most distressing accident, the tank burst when she "touched" it. Only seconds earlier, her justifiably concerned father had said that she had "bounced into the glass".

Full marks to Ian and Moira Halwood for having the courage to face the cameras after such a harrowing experience, and for having the good sense to persevere with their hobby... but ensuring that their new tank (containing some excellent Fancy Goldfish) is now placed well out of their children's reach.

In the end, the programme could have been a lot worse. It could also have been a lot better, perhaps by taking the opportunity to reassure potential aquarists that the world is not full of shattering tanks, and that the aquatic hobby is considerably safer than hang gliding!

They did end, however, on a commendably high note by showing the OFI (UK) logo on-screen and directing people to the organisation for sensible advice on purchasing aquaria. A very useful sheet on this subject may be obtained very shortly from: OFI (UK), Bedford Business Centre, 170 Mile Road, Bedford, MK42 9TW. Tel: 0234 273933; Fax: 0234 273550.

We hope to have further news about this and other OFI (UK) developments next month. Watch this space!



John Dawes
Editor

News Desk

Crocodilarium Award

The first purpose-built crocodilarium in the United Kingdom has received an award from the Universities Federation for Animal Welfare (UFAW).

The Zoo Animal Welfare Award for the Swamp House at Thrigby Hall, near Great Yarmouth, is one of two presented this year by UFAW, the other being awarded to the Chimpanzee and Gorilla House at Belfast Zoo.

Thrigby Hall's Swamp House is the first purpose-built crocodilarium in the UK and received the award for "its innovative and comprehensive approach to meeting the needs of Marsh Crocodiles and American Alligators," according to UFAW.

"Of equal importance is the demonstration to other zoo managements and the general public that the environment of

reptiles can be enriched without vast capital or maintenance costs."

The Swamp House is constructed with twin-wall polycarbonate sheeting which provides varying natural light throughout

the seasons and contributes to heating requirements by insulating the enclosure. The indoor pools vary in depth with access points for basking and nest building in the landscaped surroundings; while the main indoor pool is connected to an outdoor lagoon, that is used frequently by the animals in warmer months.

Making the award on behalf of UFAW was James Ellis, better known for his role as the head keeper, Paddy Reilly, in the BBC

TV series *One by One*. Jimmy is also vice-president of the British Veterinary Association animal welfare committee.

Universities Federation for Animal Welfare, 8 Hamilton Close, South Mimms, Potters Bar, Herts, EN6 3QD. Tel: 0707 58202; Fax: 0707 49279.

Thrigby Hall Wildlife Garden, Thrigby Hall, Filly Road, Thrigby, Gt Yarmouth, Norfolk, NR29 3DR. Tel: 0493 369477; Fax: 0493 368256. Contact: Ken Sims, director.

Tortoise-Care Leaflet

Britain's largest veterinary charity, the People's Dispensary for Sick Animals (PDSA), has published a leaflet providing information on the care of pet tortoises and terrapins.

The leaflet includes detailed sections on housing, feeding and hibernation, as well as advice on how to keep a tortoise or terrapin healthy, and is available free of charge.

The PDSA is particularly concerned that every year, up to 20% of tortoises emerge from



The first purpose-built crocodilarium in the United Kingdom.

hibernation suffering from either an infection or poor health. "Mediterranean tortoises are no longer available, following an importation trade ban imposed in 1984, but there are still quite a large number of tortoises kept as pets in Britain," explained PDSA spokesperson Gill Gannon.

She continued: "The cold long British winters often result in tortoises remaining in hibernation for three to four months, when Mediterranean tortoises would normally be in hibernation for no more than 12 weeks in their native country. Over a number of years, such extended periods of hibernation, together with fluctuating British temperatures, can cause slow deterioration in the condition of some tortoises."

The PDSA operates 50 veterinary centres throughout Britain, and expects to treat nearly 800 chelonians per year (575 tortoises, 185 terrapins, 15 turtles). According to a recent survey conducted by the society, the most commonly treated ailment in tortoises would appear to be post-hibernation anorexia, which often requires hospitalisation for several weeks.

The most frequent treatment required by terrapins is said to be for Hypovitaminosis A, which is generally a result of poor diet and management, and also requires hospitalisation.

The society also tries to encourage owners of chelonians to pay particular attention to their animal's health by arranging a check-up before and after hibernation, and the PDSA also issue a badge "A healthy tortoise is a happy tortoise," priced at 50p each.

Also published by the PDSA is a leaflet entitled *Keeping an Aquarium*.

People's Dispensary for Sick Animals, Whitechapel Way, Priorslee, Telford, Shropshire, TF2 9PQ. Tel: 0952 290999; Fax: 0952 291033. Contact: Gill Gannon.

Visionary Aquatic Hotel Display

The Coppid Beech Hotel, a luxury 4-star, 205-room development, next to the John Nike Leisuresport Complex, is opening this month in Binfield, near Bracknell, Berkshire.

The vision and design ideas



Lifting one of the 18, 1000-lb sheets of toughened glass into position. See next month's *A&P* for all the details.

behind the hotel are those of John Nike, whose companies, Nike Design Ltd and Nike Construction Ltd, have been responsible for producing the working plans/drawings and construction work respectively.

The unusual architectural design of the hotel, based on an alpine theme, with three main wings off a central triangular core, has lent itself to what is probably the most exciting aquarium display project to be seen so far in the UK hotel.

The contract for nine, large (10ft x 5ft) tropical freshwater aquaria wrapped around the central triangular core (atrium) on three floors of the building was put out to tender many months ago to the best of the UK companies operating in this field.

In June of this year, Jerzy Gawor's company, Aquality — Aquatic Project Consultants, was awarded the contract to provide the final design (based on John Nike's very specific requirements — more on these next month), specify/supply all the materials and equipment, as well as construct and commission the entire aquatic display feature.

Starting in next month's *A&P* as a two-part feature, Jerzy will describe some of the technical and architectural details which make up this unique display, showing how eighteen 10ft x 5ft sheets of toughened/laminated glass almost TWO INCHES THICK and weighing an astounding 1,000 lbs each (!) were carefully

hoisted off the ground floor and winched up the central core to their final 'aquarium' positions. Jerzy will also relate some of the planning that is required to get a project of this magnitude off the drawing board and into a three-dimensional 'living' reality. Watch this space!

Supreme Festival Programme

An exciting programme of events at this year's Supreme Festival of Fishkeeping, at Pontin's Sand Bay Chalet Hotel (6-8 November), is promised by the Federation of British Aquatic Societies (FBAS), who are organising the event in conjunction with Interpet, sponsors of the show.

A European Open Show is being featured at the Supreme Festival, for the first time in a UK aquarists' show, and UK aquarists will be participating in the FBAS Supreme Championship. Also among the show's highlights will be lectures from top European aquatic specialists Dieter Vogt and Heiko Bleher.

Admission is £1.50 for adults and 50p for senior citizens and children (under 16). A weekend residential package at the festival venue, Sand Bay Chalet Hotel, near Weston-super-Mare, is available at just £57 per person (£35 for juniors under 16 and £20 for those aged 1-10) and last-minute bookings can be

arranged by contacting Colin Richards (Tel: 0494 773094) or Mike Clarke (Tel: 0306 881033).

Ocean Vigil to Keep Environment Safe

An environmental study of the world's oceans is being carried out by yachts participating in the British Steel Challenge round the world yacht race.

The study, entitled Ocean Vigil, aims to provide a "snapshot" of the world's oceans, recording sightings of dolphins, whales and pollution, and information gathered will be processed by the Marine Conservation Society and passed on to specialists.

The race started at the end of September and, in addition to its participation in the vigil, *British Steel II* will take marine samples from remote areas of the world's oceans to be brought back to the laboratory for analysis.

The assistance of the round-the-world yacht race was enlisted by wildlife researcher Brian Van Herbert, who believes that some phytoplankton — single-celled plants which form the basis of the food chain — could be at risk of extinction. "Widespread dispersal of marine invertebrates and plants might suggest that these would be at low risk of extinction," explained Brian. "That just isn't so."

He continued: "The loss of

marine species, and genetic and ecosystem diversity is a global crisis in its own right."

Brian explained that the round-the-world race will cover oceans not normally sampled in other oceanographic programmes. Once samples are collected, by a mesh system, they will be preserved on board *British Steel II* and returned to the laboratory at the University of Westminster for counting and identification by light microscopy.

"It is likely that we will find some poorly known species and such specimens can be used to improve our taxonomic knowledge, and thus improve our knowledge of largely unexplored oceans," Brian remarked.

Additional research includes the measuring of salinity, conductivity and temperature while on the move, while information on weather conditions and sea state will also be collated by the crew. "Due to ozone depletion, a high level of radiation is causing the polar ice caps to melt, with icebergs moving north, bringing cooler waters and reducing the rainfall cycle to the land," said Brian.

Further information is available by contacting Brian Van Herbert, Wildlife Research, Operation Global Warming, PO Box 4AZ, London, W1A 4AZ. Tel: 071 380 0589; Fax: 071 636 9179.

FBAS Waltham Welcome

Members of the committee of the Federation of British Aquatic Societies (FBAS) were welcomed by the Centre for Pet Nutrition at Waltham-on-the-

Wolds, Leicestershire, recently.

Among the topics discussed during the visit were joint projects for 1993 between FBAS and 'Aquarian'; while the committee were also able to see and discuss the work of the centre's staff of veterinarians, scientists and nutritionists in the study of nutrition and disease treatment of ornamental fish.

The Waltham Centre was established to study the needs of all pet animals, and it was here that the range of 'Aquarian' flake fish foods was developed.

Cichlid Guides in Colour

Two new information pamphlets have been published by the British Cichlid Association (BCA) and, for the first time, they are illustrated with colour photographs.

In addition, these are the first two in a series of *Beginner's Guide* published by the association, and cover Mbuna of Lake Malawi (written by Mary Bailey) and South American Dwarf Cichlids (written by Ian Watson and Roman Sznober), respectively.

Edited by BCA editor, Jeff Challands, both guides are eight pages in length and provide advice and guidance on getting started in the cichlid hobby, with information on setting up a cichlid aquarium, water conditions, feeding and species selection, among the topics comprehensively covered.

Editor Jeff Challands explained that the introduction of colour and a *Beginner's Guide* series are new departures for the BCA, which is currently cele-

brating its 21st anniversary year.

All BCA members will receive a copy of the guides; while a limited number of copies are available to non-members, price £2, by contacting Ian Fairweather, BCA Sales Officer, 7 Delamere Avenue, Sale, Cheshire, M33 2PN.

Fish Conservation Action Plan

The Freshwater Fish Specialist Group (FFSG) of the Species Survival Commission (SSC) is seeking support to develop a worldwide action plan for freshwater fish conservation and to lay the groundwork for implementation of field projects identified as critical within the plan.

The long-term goal of the project is to prevent the extinction of threatened species of freshwater fish and to restoring the populations to viable levels. The elements of the plan are:

- 1 A worldwide review of current knowledge on the status of freshwater fish populations;
- 2 Identification of the threats facing these populations throughout the world;
- 3 An historical review of fish conservation to date, noting both successes and failures;
- 4 Fish conservation options, including the formation of prioritised action guidelines.

It is estimated by FFSG that development of the Action Plan will take two years and cost \$95,000. To date, well over half has been committed jointly by the IUCN (International Union for the Conservation of Nature and Natural Resources), SCC Peter Scott Action Plan Fund and Fauna and Flora Preservation Society.

According to the FFSG, it is becoming increasingly urgent to assess the conservation status of freshwater fish throughout the world and to map a strategy for ensuring their survival.

"Freshwater fish are important indicators of the health of aquatic ecosystems," states FFSG in a recent issue of their newsletter *FISH*. "They are culturally significant to societies throughout the world, having long provided an important source of protein in many communities. They are also of great recreational value to nat-

uralists, sports enthusiasts, and home aquarists.

"Freshwater fish face a number of environmental threats. Habitat changes, such as channelisation, mining and man-made lakes are very damaging to river ecosystems; while aquatic environments are polluted by sewage discharge and toxic substances. Over-fishing and introduction of exotic species also pose threats."

Once the plan has been completed, it will be distributed to government departments and conservation organisations with responsibility for conserving freshwater fish, as well as to FFSG members and other contacts; while FFSG will promote the plan's implementation, closely monitored by FFSG chairman Dr Chris Andrews, senior director of husbandry and operations at the National Aquarium in Baltimore, USA. Dr Andrews has, over the years, been actively involved in the conservation of freshwater fish through work at London Zoo, Baltimore Aquarium and IUCN.

FFSG has also obtained the collaboration of Dr Simon Mickleburgh, of the Flora and Fauna Preservation Society, who has been involved in field work on birds, bats and amphibians, and in the production of an Action Plan for the 150 or so species of Old World Fruit Bats.

Members of FFSG will be contacted with a preliminary questionnaire. Members and non-members are invited to contact either of the following sources for further information:

Dr Chris Andrews, Senior Director of Husbandry Operations, National Aquarium in Baltimore, Pier 3, 501 E Pratt Street, Baltimore, Md 21202, USA. Tel: 410 576 8239.

Dr Simon Mickleburgh, Fauna and Flora Preservation Society, 1 Kensington Gore, London, SW7 2AR. Tel: 071 823 8899; Fax: 071 823 9690.



FBAS committee members are welcomed at the Centre for Pet Nutrition at Waltham-on-the-Wolds, Leicestershire. Left to right: Peter Cottle, standards chairman; Bob Esson, president; Peter Furze, editor, *Fish World*; and Joe Nethersell, chairman.

NEXT MONTH IN A & P

- 1 MARINE SUPPLEMENT
- 2 CHRISTMAS SHOPPING TIPS

Letters

Counterfeit Dollar Tetra Identified . . . by its Discoverer

The Counterfeit Silver Dollar (see *Traditions Reign in Florida* — August '92 *A & P*, pages 40 and 41) is known scientifically as *Gymnocorymbus socolefi*. This fish originates in Central Colombia, near Puerto Lopez, where I discovered it in 1962.

Adults in the wild resemble the fish produced in Florida, but the half-grown wild fish are unlike any fish that has been raised in Florida. These last have blood-red anal fins and slightly less intense reds in the caudal. The colour in domestically raised fish (at best) has only slightly pink colours.

Henrik Hansen (Hank) spent a lot of time with this fish in the early 1960s. He was the first to reproduce them. Hank was aware of the highly coloured wild fish, as he was breeding from the red-finned wild fish. I have no idea what is lacking in the Counterfeit Silver Dollars produced in Florida (water or diet?), but the wild coloration has never been achieved. This phenomenon is not an unusual occurrence, but is more apparent in *G. socolefi*.

This colourless fish was destined for an early discard until Claude Gladden, a fish breeder in Gibsonton, Florida, discovered that the fish grows large and well in outdoor ponds. Another plus is its resistance to cold. Its discoid shape is reminiscent of the 'real' Silver Dollar fish (*Meynis species*),

and the lack of colour further enhances this description.

The fish has been sold for 30 years as the Counterfeit Silver Dollar, and I attribute its steady sale mostly to this clever name. The species keeps and breeds as the Black Tetra (*G. ternetzi*) and spawns are very large.

Ross Socolef,
Bradenton,
Florida.

'Patented' Plants

I read with interest your editorial on *Patented Guppies* (September 1992) and wondered if you were familiar with a similar situation in horticulture.

Newly-bred plants can now be protected by Breeders' Rights and no propagation of such plants can be carried out without payment of royalties.

Certain of these plants are hybrids, incapable of true reproduction from seed, but they can, of course, be grown by vegetative reproduction, the commonest method being cuttings.

The whole point of the protection offered by Breeders' Rights seems to be to prevent mass production by unlicensed growers, who would rob the original producer of a reasonable return on his or her investment, something that may be seen as quite fair.

I do believe, however, that this will not really affect the small operator. For example I bought one plant of *Fragaria* Pink Panda, a protected plant, and it has produced hundreds of offsets. Were I to give a few away, I doubt I would attract

any interest from the breeder. On the other hand, should I offer large numbers for sale in the garden centre I work in, I'm sure I would fall foul of the Breeders' Rights.

I realise, of course, that most of the points you raised in your editorial are there to encourage awareness, but I hope my letter may give some idea on how such a scheme could possibly be run.

D S Gilliam,
Medina Garden Centre,
Ryde,
Isle of Wight.

Canary Parrots

Late last year, our local supplier had a pair of Blood-red Parrotfish, introducing them as a new breed, which interested us greatly. Your article in the February '92 issue of *Aquarist & Pondkeeper* further endorsed our keen interest in owning some.

Imagine our delight when visiting another local supplier to find about a dozen baby Parrotfish at a reasonable cost. Although completely dark brown at the time, we were advised that they would probably change colour as they matured — and change they have! Our three Parrots are almost 2in long . . . and are completely canary yellow! Is this a new strain, or are they likely to change colour again?

I have to admit they are an absolute delight. They are afraid of nothing, are perky and share a 36 x 18 x 18in tank with a variety of large fish, including six Severums, a Gold Saum, an Aequidens, *Spilurum* and three

Hondae, all in excess of 4in long, without any problems. They are certainly not shy fish, and when food is about, they are the first in the queue.

Our supplier can tell us no more, except that the fish were supplied from Holland.

Roger Burnay,
Woking,
Surrey.

[We have suspected for some time that the Blood-red Parrot is a mutant strain of the *Severum* Cichlid, but can't yet confirm this. We need details of successful spawnings, with the subsequent raising of the fry. So, if any A & P readers have achieved this, please let us know.

On a different note, one Singapore breeder we have spoken to, maintains that Roger's Canary Parrots will end up as Blood-red Parrots when they attain full size. We are also told that a Green Parrot has recently made an appearance. If anyone has come across this fish, we'd love to know. Ed.]

Gratifying Bubble-eyes

I've read the letter from "Disgusted of Colombo" (*A & P* September 1992) with great interest.

I have a large framed print of this same picture in the bookshop at the Goldfish Bowl. It is hung just inside the door and is one of the first pictures to take the attention of callers.

Of the many photographs on display, this one provokes more comment than all of the others



The Counterfeit Silver Dollar. As its discoverer explains, it's been



put together. Some share the revulsion of J A M Alvarez, while others find it hugely amusing; some admire it for its photographic qualities, and not a few regard it with total disbelief. The important factor from my point of view is that it does attract attention and comment, confirming that impact is undoubtedly achieved.

My personal love of Fancy Goldfish does not truly extend to the Bubble-eyes, Celestials, and other rather grotesque strains, although the Moor with its 'boggle' eyes is my favourite. Not beautiful for sure, but fascinating to me.

However, as a photographer, I find the extreme developments of any man-made fish varieties excellent subject material. Certainly, the extraordinary finnage development of the male Delta Tail Guppy or male Betta provide rewarding subjects, but so much easier to catch in profile and have sharp focus from nose to tail.

[See this month's cover for one of Max Gibbs' Betta pics. Ed].

With the Bubble-eye, it was necessary to concentrate on having the impact area of the eyes and fluid-filled sacs as crisp as possible, with the sparkling dorsal area discernible, and the far extremities of the caudal fin as clear as circumstances would allow. Those considerations add up to a far greater

challenge, making a satisfactory result most gratifying.

Whatever, though, I was pleased that the picture moved J A M Alvarez to write. I doubt that he would have written to compliment you on the publication of a pretty fish picture!

Max Gibbs,
The Goldfish Bowl,
Oxford.

Bubble-eyes are not Monsters

I have kept fish for about a year now and have three coldwater tanks and a large tropical tank.

I decided in September to start buying your magazine, and was totally appalled to read the letter about Bubble-eyes from J A M Alvarez.

I can assure you that these lovely fish are anything but monsters. I have a pair in my tank and they have a great character. They even hand-feed and chase each other up and down the tank.

I hope you will print this letter to let people know that, unless you have personally kept these fish, you cannot possibly offer an opinion on them. I also hope you will continue to publish items on fish like this, as they need more publicity.

Margaret Ross,
Armadale,
West Lothian.

The Bowlers



"I don't know about you, but I think it's time we were given some clean water."



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Jason Endfield

The Frustrations of a Fishkeeper

Most people get into keeping Gouramis via the pleasant route. Not so Jason Endfield!



"Well, basically, it started with Guppies," said the man who was standing perhaps a little too close to me in the fish shop. "Then I progressed to Anabantoids," he said with a wink that made me feel very uncomfortable. "Tricky things, Anabantoids," he stated and then he placed his finger on his cheek and looked at me as if waiting for my reaction.

"Yes," I said, edging away in a vain attempt to terminate the conversation. That was the answer he had hoped for and his face lit up.

"Aha!" he exclaimed, frightening the life out of me. "I thought you'd say that. But the truth is that they're easy when you know how, and oh, I'm very experienced with them."

He went on to describe very fully how to keep Anabantoids in general alive and well, and so desperate was I to detach myself from this one-sided conversation, that I pretended to him that he had persuaded me to buy a pair of Gouramis.

"See you around then," he shouted at me as he left me in the shop. "And don't forget — Anabantoids are fun!"

I looked over at the shopkeeper who looked sympathetically back at me and shrugged his shoulders. We agreed that the talkative chap was a strange case, best ignored, and after purchasing a pair of rather nice Gouramis I left the shop. As I journeyed home with my new acquisitions, I realised that I'd forgotten the fish food that I'd gone into the shop to buy in the first place.

That all happened two years ago. I still have those two Gouramis, and about a week after the event, I remembered to buy the fish food.

Well, I'd forgotten about it all until I was queuing in the bank a few weeks ago and felt a tap on my shoulder. Turning round, to my horror, I saw the same chap who engaged me so in the fish shop two years earlier.

"Well I never did!" he exclaimed, as if encountering an old friend. "Oh my," I said in monotone looking for the fastest escape route. I'd queued for 15 minutes though, and desperate though I was to make my exit, I refused to give up my place just because this nutcase was behind me.

"Well, well, well, well, well," he said, using five words when one (or none) would have sufficed. "It's the strangest thing — I was only thinking about you yesterday", he said.

"I've been having some trouble with my Anabantoids," he added rather indiscreetly, and rather loudly. Two women standing alongside us in an adjacent queue turned around and looked at me thinking I had said the offending words.

"They're HIS Anabantoids," I explained, though they were obviously unconvinced and muttered something about 'unsavoury characters'. Meanwhile, the nutcase fellow continued to prattle on. "I remember telling you that Anabantoids were easy. Well, if you want my advice now (NO!), tread carefully."

"I will," I replied, "but, you know, I still have the two Gouramis I bought two years ago on your recommendation, and they're doing fine". I felt very superior. "Ah," said the man, "sticking with the easy ones, eh? Don't blame you either."

I was about to punch the offensive man in the face, but it was my turn next at the bank counter. Just as I was about to be served, the teller put the 'desk closed' sign up and peals

of laughter rang out from behind me.

"It's not your lucky day," said the stupid little man behind me, who had also missed his turn but didn't seem to mind; his mission to aggravate me had been accomplished. I decided I'd had enough and left.

The man followed me halfway down the street, pointing out how strange it is that 'bank' rhymes with 'tank', and then I managed to lose him by running ahead, into a nearby greengrocers. I didn't actually need anything in there, though I ended up buying some very fresh parsnips... which I've never liked, but there we are; saved by the parsnips, one might say.

Thus far, I haven't encountered him again I'm relieved to report. I hope I never will. I do still have the odd nightmares and people snigger in the street and point at the man with the 'anabantoids' as though it were some unsociable disease (it isn't, is it?).

But such drawbacks do have their good side, and I have to say that if it were not for the strange nutter in the fish shop that day, I might not have tried Gouramis. Mind you, I might never have been a nervous wreck and a laughing stock either, but such are the frustrations of being a fishkeeper. ... **AMP**



Although I do not agree with the keeping of certain invertebrates in the aquarium, there can be no denying that there has been a tremendous growth in this field of marine aquarology in the past few years. With this in mind, I thought that I should say something about successful invertebrate keeping.

WATER QUALITY

The key to successful invertebrate husbandry is minute attention to water quality. Seawater that is anything less than absolutely perfect just will not do.

I should never have to tell you that ammonia and nitrites have no place in any seawater aquarium. However, in addition, elevated nitrate levels are not well tolerated by many sessile invertebrates. Corals and anemones, for example, stop feeding at nitrate levels as low as ten to fifteen parts per million, values which are quite acceptable to most reef fishes.

Even some motile invertebrates — for instance crabs and shrimps — are uncomfortable in water with nitrate readings in excess of ten parts per million. For example, concentrations of ten to fifteen parts per million seem to complicate the moulting process in shrimp species.

Not surprisingly, invertebrates are most easily cultured in aquariums equipped with protein skimmers and trickle filters. However, regardless of the system chosen, it is pointless to try introducing invertebrates to an aquarium until its filter has been thoroughly run in. For this reason it is much easier to establish a successful community in the absence of fishes, than to attempt the

introduction of most of the sessile species into an established fish community. Once established, a collection of invertebrates which contains a fair proportion of species with symbiotic algae in their tissue, as well as lush growths of *Caulerpa* and several pounds of living rock, is usually capable of handling the nitrate output of a few small fishes.

SALT MIX

It is false economy to skimp on the quality of synthetic salt mixes if one wants to be successful in keeping invertebrates. The best course of action is to determine which brand your dealer uses and follow his/her lead. It also pays to find out the specific gravity of the dealer's water before setting up your aquarium.

Invertebrates as a group seem more sensitive to changes in salinity than are fish. The more similar the density of water in their old and new homes, the more easily they can be acclimated to a new set of living conditions.

LIGHTING

One other crucial point is the amount and quality of lighting to be used. It is impossible to maintain invertebrates which house zooxanthellae within their tissues successfully in anything but brightly-lit aquariums. These animals cannot sustain themselves solely on the food they capture and consume. They require nutritional input from their algal lodgers, and these cannot flourish in dim light.

To a great extent, the style of lighting is immaterial, providing that the correct spectrum is

employed, along with the correct intensity. There are many types of light which can be utilised under an aquarium hood. Many people still like to use fluorescent tubes, and these can be obtained to provide a spectrum of lighting which would replicate the light output of the sun. These, of course, are the type to go for.

However, it is always a good idea to mix tubes as much as possible — although the red fluorescent tubes which are popular for freshwater aquariums have (in my view) no place over a marine tank.

In addition to white lights, many people nowadays use Actinic 03 blue tubes, to bring out certain colours in some corals and anemones. This seems to make good sense, but one thing should be borne in mind. If a tube of 24in (60cm) length is used, this will have a rating of 40 watts, and so, a 40 watt starter has to be used with it. A 20 watt starter will over-heat and could cause a fire. Having said that, Actinic 03 tubes do have a role in an invertebrate aquarium and should be used with white lights at a rate of about three whites to one actinic.

As I said, lighting has to be of a high intensity and there lies the problem if using fluorescent tubes: there just won't be enough room in the hood! Metal halide units seem to be the most popularly used nowadays, but these are expensive — we are talking hundreds of pounds here. However, the whole venture will quickly be called into question in the absence of such a commitment.

Not all invertebrates require such intense lighting of course. Most motile species are indifferent to light intensity. Even among sessile species, there are soft corals that are best kept in dimly-lit tanks or situated in the shadow of a tank's rocks, lest they be overgrown with filamentous algae.

FEEDING

Just as fish's feeding patterns and food requirements vary enormously, then so do those of invertebrates. However, as a general rule, most invertebrates will do well on a diet of live brine shrimp, food tablets —

crushed into a powder and fed in suspension if necessary — freeze-dried and frozen food (there are several types of frozen invertebrate foods on the market nowadays, and your retailer should either stock them or be prepared to get them).

Many species of sessile invertebrates require regular feeding with very tiny planktonic organisms, such as the green alga *Chlorella* and the marine rotifer *Brachionus*. These are not difficult to culture, and the name and addresses of companies which can supply starter kits and culture instructions are available to anyone who cares to write to me care of the magazine. One spin-off from success in culturing these organisms is that the aquarist will also be able to attempt to rear the larvae of marine fishes!

WATER CHANGES

Regular readers will be well aware of my view on water changes — there is no filter aid, however good (and some are very good) as effective as regular partial water changes. There have been many people in recent years who have tried to tell us that water changes are maybe not so important.

I, personally, when giving a lecture on the subject, was told by one of the audience that it is unnatural for coral animals to get water changes because they never occur in the wild! (only twice a day!) I have not seen or heard anything to convince me that I am wrong. One tip, however, with invertebrates would be to change less water in one given water change, but do more water changes.

Of course, if you are unfortunate enough to have terrible tapwater (which most of you have!) then you will have to do something to treat it before you mix up your salt water. The most popular tapwater treatment used among invertebrate aquarists seems to be reverse-osmosis. Like metal halide lighting, this proves very expensive but — again, like metal halide lighting — the investment involved is an investment in the success of your aquarium.

Meanwhile, I'll be with you next month. . .



All invertebrates, whether hard-shelled or not, require good water quality for long-term survival.



Believe it or not, there's a pond under here! A cover will help in preventing the rapid loss of warmth from the pond as winter approaches, thus extending the feeding season of the occupants.

LOOKING FORWARD TO WINTER

As autumn gains pace and temperatures drop, Peter Skinner of Koi Kraft lays the foundations for successful winter care of pond fish.

Illustrations by the author

The onset of winter frequently induces a state of panic in new pondkeepers, with fears of what a spell of severe weather may do to their beloved fish. In fact, most of the common species of pond fish cope remarkably well with the winter because they are indigenous to the region and have evolved various methods of coping with the cold. If you do experience problems with your fish as a result of the winter, it is then highly likely that the fish are in less-than-ideal conditions and that they have suffered as a consequence.

The species usually kept in garden ponds such as Carp, Orfe, Goldfish, Tench, etc are commonly referred to as coldwater fish. This is incorrect. Coldwater (psychrophilic) fish are those which can metabolise food at low temperatures. This is not the case with the 'domestic' varieties since they stop feeding below a certain temperature. Therefore, the proper classification for these is coolwater (mesophilic) fish, which implies that they

enjoy the middle range of temperatures, rather than the extremes.

These fish will slowly enter a state of dormancy as the temperature begins to fall in the autumn, and their heart rate will be lowered and feeding will eventually cease. The activity of the fish will be reduced and they will try to find the deepest or most sheltered point in the pond where there is minimum turbulence. By doing this, they will conserve their bodily resources so that they can survive for a long period in this state.

REDUCED IMMUNITY

One extra effect of this semi-hibernation is that the immune response of the fish will also be reduced but, in nature, this would have no detrimental effect on health because the water conditions are good. Unfortunately, all too often in the garden pond, water conditions are less than ideal.

If the filtration system is inadequate and the water is dirty, or if some unquarantined

fish are introduced to the pond, this would normally be a source of parasites or pathogenic bacteria which are opportunistic and will seize any chance to infect a stressed fish. It is true, however, that the activity of these bugs is reduced when the water temperature falls, but don't be complacent because autumnal infestations are common among fish in less-than-perfect conditions. If the temperature drops below 42°F (5.5°C), pathogen reproduction, in most instances, is too slow to pose a threat to the host.

SURVIVAL CAPABILITIES

The ability of the fish to survive the winter can be determined by the duration and severity of the cold weather. A short, sharp winter is preferable to a very long, mild one because the condition in which the fish emerge from their dormancy will depend upon how much of their bodily reserves have been consumed.

If the fish were to stop eating in mid-October and not start again until early April, then they could be considerably weakened in the spring. This problem can be exacerbated if there are frequent sunny days in the middle of winter because the fish will tend to move about, and this activity consumes valuable energy.

A far more favourable chain of events would be for the weather to be mild in the autumn and for the fish to continue eating for a little longer before the weather gets cold, and then for the temperatures to recover early in the spring. This would mean that the fish will be stronger and better able to cope as the weather becomes warmer.

AUTUMN STEPS

There are several things that can be done in autumn to improve pond conditions for the winter. The first is to make sure that the pond and filtration system are as clean as possible before the fish stop eating. Remove all dead leaves, blanketweed, droppings, etc.

While the fish are eating eagerly, they should be given a high protein food for a few weeks until they no longer take floating food; then they should be given sinking wheatgerm food for as long as they want it. By doing this, you will ensure that their bodily reserves have been built up as much as possible before the winter.

TEMPERATURE CONSERVATION

The most damaging thing to fish in the winter is rapid fluctuation in temperature; the deeper the pond the more slowly this will happen. The earth temperature remains fairly constant below the topsoil and, therefore, the fluctuations in water temperature are dictated by the effect of the sun, wind and the ambient temperature on the surface of the water.

For this reason, a pond 1.5m (nearly 5ft) deep with, say, 10 sq m (about 110 sq ft) surface area will be preferable to a pond with the same surface area but being only 0.5m (some 20in) deep.



Sophisticated temperature control: an electric in-line pool heater.



Remember to test the water frequently in the spring, particularly for ammonia and nitrite. These may both show an increase after the winter 'rest'.

WINTER: ARE YOU PREPARED?

✓ RIGHT



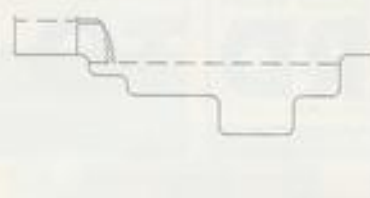
This pond has a large volume-to-surface-area ratio, which means that water temperature fluctuations will not be rapid. This is a good design.

Also, a glass or polythene cover, or even bubble-wrap stretched across the surface of the pond, can help greatly. Any external water containers should also be insulated and waterfalls should be turned off, since they will act as radiators and valuable heat will be lost.

WINTER FEEDING

Occasionally in the depths of winter, there will be a few days which are sunny and the

✗ WRONG



This pond has a low volume-to-surface-area ratio, which allows rapid temperature fluctuations that may be detrimental to the fish.

fish will swim around as if they are looking for food. It is important that they are not fed unless the temperature is above 55°F (around 13°C) and likely to stay there for several days. If you were to feed them and then the temperature were to drop rapidly, they would then not digest their food and it could rot in their stomachs, with catastrophic effects.

Another complication with winter feeding is that the bacteria in the filter will not be functioning very well and, therefore, if you

are not careful, you will get an ammonia build-up in the water, an occurrence which should be avoided at this time.

FILTRATION AND HEATING

I am a firm believer in filters being run continuously throughout the winter. They will not only keep the pond that little bit cleaner, but will also help to prevent the formation of ice on the surface of the water. This is a useful function, as it allows gas exchange from water to the atmosphere.

Nowadays, more and more people are including heating systems in their Koi pond installations. These are useful in prolonging the feeding period by maintaining the temperature in the upper fifties°F (around 14°C).

I personally advocate that the pond be allowed to cool for at least six to eight weeks in December and January. The fish will not be feeding at this time, but the cool period will not be long enough to deplete their bodily reserves. At the same time, you will not be interfering too much in the natural course of events.

MEDICATIONS

One last point: be very careful in the use of medications when the water is cold. Most of the common medications will degrade naturally in the water but, in winter, this process can be much slower.

If you were to administer multiple doses to the pond, rather than maintaining a constant therapeutic dose for the required time, you will, in fact, have an accumulating concentration because the previous application will not have degraded in time. This is to be avoided. Organophosphorus compounds, such as Masoten and Diptorex, are nerve toxins and will cause irreversible damage if the concentration is too high, or the exposure period too long.

SUMMARY

In summary: you must maintain optimum cleanliness, prevent rapid temperature fluctuations and observe the golden rules of autumn and winter feeding. All this, coupled with a well designed pond, will mean that your fish should emerge from the winter unscathed and fighting fit!



If you expect ice to form on the pond, it is wise to use a small floating heater such as this. It will not alter the temperature of the pond, but will keep a small area of the surface free of ice, to allow gaseous exchange.

THE GULPER GOBY CHALLENGE

Sandra Witter found a pair of colourful interesting gobies which soon settled in... so well, in fact, that they spawned. Then the problems started...

Having just matured our marine fish/invert corner tank and being eager to get it stocked, we have clocked up quite a few miles trying to seek out some of the more unusual marine fish. At one of our regular calls, we were introduced to the 'Gravel Gulper Gobies', so named in the shop because of their tendency to gather up huge amounts of coral sand in their mouths and expel it from their gills. They were beautiful little fish, a translucent silvery white, with bright yellow cheeks and a tiny, almost fluorescent, blue stripe through the yellow cheeks.

The few shops that stock them know them as Blue-Cheeked Gobies. After much searching, we first thought that they were *Elo-triodon striata*, or the Golden-Headed Sleeper (Page 355.00 of *Exotic Marine Fishes* by Axelrod, Burgess and Emmens). Dr Burgess's *Atlas of Marine Aquarium Fishes* (TFH) lists them on Page 566 as *Valenciennia strigata*. Both the same fish, with different names!

EARLY DAYS

Picking the two largest, healthiest-looking fish from the selection, we headed off home clutching our purchases, and introduced them to their tankmates, leaving them to settle in.

They immediately shot off into a crevice in the rocks, venturing out only at feeding times, when they spent an hour or two moving the coral sand around the tank as they sifted through it in their inimitable fashion, supposedly searching for food.

They were rarely seen, as they only appeared round about nine in the evening when they expected us to feed them.

UNEXPECTED SURPRISE

One day, a few weeks later, we noticed that they'd moved house, and this was confirmed when new mountains and hills suddenly started appearing around their new front door. We were thrilled to discover that the interior of their new dwelling was perfectly viewable from the side of the tank.

A few days later, the female disappeared for a couple of days. She didn't come out at all, and, on peering into their burrow, we discovered a mass of white stuff hanging from the ceiling, looking much like a large blob of spittle! The mass wasn't recognisable as eggs, but eggs we supposed they were. Our 'Gravel Gulpers' had spawned.

FOOD SEARCH CHALLENGE

Looking to the future, I immediately tried to telephone our illustrious editor for advice (*What illustrious editor?! Ed*). Unfortunately for us, he was away but Vivian, his wife, (who handles the *A & P* editorial administration) very kindly supplied me with a couple of names and telephone numbers of people who might be able to help.



A colour painting I prepared while I was attempting to identify my 'Gorgeous Gulpers' shows the attractive cheek patterns and long flowing extensions to the dorsal fin.

These were Graham Cox of Waterlife Research Industries in Middlesex, and Richard Sankey of Tropical Marine Centre. Just our luck: Richard Sankey was away on business, although his staff did tell me that they couldn't supply me with rotifers.

Graham Cox, at Waterlife, was most enthusiastic. He agreed with me, that I ought to try my hardest to hatch and raise the young, and even suggested the correct names of the rotifers to try, these being: *Brachionus plicatus*, which should themselves be fed on a phytoplankton species such as *Dunaliella* or *Phaeodactylum*.

He also suggested that, for short periods, the cultures could be tried on liquified yeast. Graham also gave me the name and address of a place that may have been able to supply me with the necessary cultures, The Institute of Terrestrial Ecology, Culture Centre for Algae and Protozoa in Cambridge.

My call to Directory Enquiries for a telephone number for this Institute were unsuccessful and a last ditch attempt of writing a letter failed when it was returned to me marked "Gone Away". So, if anyone from the Institute reads this, I would like to know where you have disappeared to!

I then spent a whole afternoon on the telephone, putting pounds into Telecom's coffers by harassing Directory Enquiries for all the Universities listed that were on, or near the coast... Surely some of them must have a Marine Biology department (a reasonable supposition, I would have thought).

I rang each and every University that I could think of, including Oxford and Cambridge, and, although some did have Marine Biology departments, none could help me by supplying rotifers or starter cultures for rotifers (See *Undesirable Obstacles* later on).

My next step was to ring round all the 'big name' aquatic shops. Of course, no-one actually sold starter cultures, but several offered to take my number and try and obtain some for me, and most even offered me Marine Liquify.

Eventually, I managed to get a telephone number for a Marine Institute, a research establishment on the coast. The gentleman that very kindly listened to my request, didn't know of the exact rotifer or its food to which I was referring, but they did keep and raise rotifers.

He would make some enquiries among his colleagues, and, hopefully, send me a starter culture, which would at least be ready for the next spawning. He agreed with me that everything possible should be done to encourage the gobies to spawn and to try to raise the fry. Unfortunately, that was the last that I heard from them!

At this point, I remember thinking, that it was no small wonder that very few marine fish have ever been spawned, or raised in aquaria. What on earth were you supposed to feed them on ??? I was offered some Marine Liquify by several retailers but, however

good this product is, it somehow didn't seem right not to provide the babies with rotifers as well. . . . I wanted desperately to do it right.

FURTHER SPAWNINGS

That evening, when we tried to peek into the sacred spawning ground, the eggs had mysteriously vanished, probably eaten by the parents, who must have been able to read my mind.

The pair then moved their abode several times over the next couple of weeks, probably trying to seek somewhere away from prying eyes. However, they then returned to the site of their original spawning again, witnessed by the varying shapes and heights of hills of sand outside their front door.

This time, we left them alone for a couple of days. The female didn't come out for food, so we hoped that a second batch of eggs was about to appear. Sure enough, when we plucked up the courage to peer around the corner of the tank, another white mass of eggs was hanging from the ceiling, but the female was nowhere to be seen.

A thorough search of the tank found her, dead and wedged between two pieces of rock. However, this didn't seem to bother the male. He protected the eggs, so we left him to it, Marine Liquifry at the ready, just in case, although we didn't think we had much chance of seeing any fry without a mother to look over them.

LATEST DEVELOPMENT

A few days ago, Keith came home clutching a plastic bag with a big silly grin on his face. "I've got another one!"



The 'Gulper Goby' — otherwise known (probably more correctly) as the Neon Faced Goby (*Valenciennes strigata*). Both sexes are very similar to each other, but the slightly larger top fish with the more 'substantial' snout is a male.

He introduced the goby to the tank and, as per its predecessors, it shot behind the rocks.

That was two days ago. Last night (as I write), at feeding time, two obviously paired up gobies suddenly appeared at the front of the tank, gobbling up the sand and spitting it out through their gills. "Look Sandra, he's got something in his mouth. Look at him."

The male, although still feeding as though he hadn't eaten for a week, looked for all the world like a human being with his cheeks stuffed full of food, and fussing over and protecting his new partner.

To begin with, I wondered if he had perhaps taken in something which had jammed, perhaps too big to expel through his gills! Then he wondered if it was some sort of growth. . . . Was he going to die too? Then another thought struck me. Apart from his mouth being obviously stuffed with something, he looked in perfect health, didn't look as though he was suffering any discomfort or anything like that. . . .

Could it be possible that this goby was a type of mouthbrooder? Was it eggs in there? At that point in time, he was back in his burrow with a head twice the normal size, but still not looking in any discomfort. We could only wait and see.

We sincerely hoped that he wasn't suffering from some strange disease, or had something stuck in his gullet. We wouldn't like to lose another of these beautiful little fish; we've grown extremely fond of our little 'gravel gulpers'. Whatever their proper name, that's what they'll always be to us.

All we can do now, is hope and pray for success.

UNDESIRABLE OBSTACLES

This whole story raises a lot of awkward questions. Loads has been written lately about the need to begin captive breeding of the magnificent collections of marine fish, especially now that our coral reefs and oceans are being polluted and killed.

Rumour has it that we shall eventually be prohibited from collecting marine fish from their native habitat, to try to prevent extinctions. However, much is also written that only a few species, such as Clowns, Sea-horses, Damsels and Neon Gobies have been successfully spawned and raised in captivity, mostly by commercial breeders.

Whichever way we amateurs look at it, spawnings of marine fish in our own aquaria come as a surprise to us, albeit a pleasant one.

It is also often written that Clownfish, Damsels and even some Angels (particularly Dwarf Angels) often spawn in home aquaria, but that hardly anyone has managed to hatch and raise the fry. Now I know why!

If we are expected to try to raise these fish at home, to try to prevent more wild fish being captured, to ensure the continuation of our hobby, then why on earth do we not have more advice and assistance on how to proceed? Why did I have to spend nearly ten pounds on phone calls, to get absolutely nowhere? Surely someone must raise these rotifers and their food supply, but who? How do I find out?

After my initial food-searching problems, I spoke to our editor and then did a little more checking up. I have since found out that rotifers can be obtained from **Underworld Products of Loughborough, Leicestershire, Tel 0509 610310.**

If you have the time to look and investigate, there are probably quite a few suppliers around the country. However, it came as quite a shock to discover that the essentials that I would need to start up a rotifer culture would cost in the region of £38 and a recommended book on how to proceed would cost me £10.50. I must admit that I was

hoping/imagining that this foodstuff for marine fry would cost approximately the same as a bag of brine shrimp or a pack of brine shrimp eggs! There is quite a big difference.

From what I have learned (to oversimplify matters greatly) there isn't too much difference between raising rotifers and raising brine shrimp; the same methods appear to be employed. (The large pop bottle, salt water, eggs/cysts, an air pump and heater), although on talking to an International Marine Aquarists' Association member, I have all but given up on the idea!

The whole process of raising fry involves finding out exactly which type of rotifer (of hundreds) your fry need, then finding out what food the rotifer requires, plus looking towards several 75% water changes in the tank daily to provide the correct density of food for the fry.

You also have to monitor your water conditions closely. Then, after a few days, the fry change (somehow) and require yet another, different food source. On top of all of that, you will also need a good powerful microscope even to see if you are being successful raising the food supply to feed the rotifers! The list is endless. . . and, it appears to be problems all the way.

It must be well past time that we as a nation of fishkeepers got together and communicated. I know that Tetra provide a welcome 'phone in service, and most experts, if you've got the nerve to ring them (if you can find their 'phone numbers) are only too willing to try to help out with problems. But there is definitely something missing. It certainly makes one think !!

ACKNOWLEDGEMENTS

I would like to take the opportunity to thank everyone who spent time listening to my woes, while trying to locate a rotifer supply. Everyone tried to help. No one turned me away, so I sincerely hope that no-one thinks that I am 'having a go' at them personally. In particular, I would like to express my sincere thanks to **Graham Cox** at **Waterlife Research** for his help and advice, and also **Dave Keeley** at **Underworld Products** who, despite being understaffed, found the time to send me some interesting literature and prices for the rotifer supplies.

FOOTNOTE

As a final footnote, it now is almost certain that our male 'Gravel Gulper' has passed on to that great coral reef in the sky. He hasn't been seen for over a week and, despite a good root around in the tank, cannot be found. I feel that we ought to strip the tank to find him, but Keith is understandably reluctant.

We shall keep our eyes and ears open for another male to replace our 'Gulper' although how we shall be able to spot a male is a very good question. I shall mourn his passing, having become extremely fond of them both.

Coldwater jottings

By Stephen J. Smith



DAVID NETS A WINNER

There was an overwhelming response to the 'Aquarian' competition in July's *Coldwater Jottings*. Thank you all for your entries. Look out for similar 'mini-competitions' in future *Jottings*.

The proud winner of the top prize, a three-foot aquarium set-up from 'Aquarian' is: **David Fanshaw** of Buxton in Derbyshire. David's, along with the vast majority of replies, was correct with all three answers, which were:

- ① *Carassius auratus*;
- ② Seven;
- ③ Dr David Ford.

WHAT'S IN A NAME?

Why should a fish which is so perfectly formed and which sports such an attractive golden colour ever be tagged with the label 'Common'. Such is the burden of the 'Common' Goldfish.

There is nothing, in my opinion, which can beat the sight of a good, healthy 'Common' Goldfish. One of the major advantages of this ubiquitous and much-maligned variety is that it is fish-shaped, and its blood-orange colour is as exciting a hue as anyone could expect from any aquatic species.

So why not give the Goldfish the respect it deserves (or is it familiarity which breeds contempt?). Two alternatives which do justice to this most popular

fish (more Goldfish are kept as pets than any other animal) are **Primary** and **Ancestral**; while the term **Traditional** is a further suggestion which I have received on my travels.

Frankly, for me, virtually any alternative is an improvement on 'common'. Where did the term originate? My assumption is that it first appeared in the early books of Goldfish standards, published by specialist societies. Perhaps they could not think of anything better at the time, and the name stuck.

Of the suggestions above, my own preference would be for the term **Primary**, suggested by correspondent and colleague **Alex Stephenson**, not least because it is from this variety that all subsequent varieties of Goldfish have been developed, over centuries, originally by the Chinese.

Perhaps you have some ideas of your own, or even disagree with my views. If so, why not drop me a line? In the meantime, how about **Primary Goldfish** being adopted as the standard terminology for the 'not-so-common' Goldfish?

FISH RESCUE

The benefits and importance of quarantining newly-acquired fish stocks were brought home to one of the leading figures in the aquatic hobby, following

the spontaneous purchase of an attractive Koi.

Joe Nethersell, chairman of the **Federation of British Aquatic Societies (FBAS)**, experienced unexplained fish losses following the acquisition of the Koi which had taken his fancy on a trip to the south of England. "Even the most experienced fishkeepers can make mistakes, and I can put my hands up and say that this was a very silly mistake indeed."

He continued, "Having returned from my trip with a very nice-looking 6-7in Koi, I placed it into my pond containing a mixture of Koi up to 20in in length. The result: unexplained fish losses. My best fish were dying!"

"Sometimes, there are benefits to being chairman of the FBAS, and my frequent contact with **Mike Clarke** of Interpet paid dividends. When I told him my sorry tale, he and product development manager **Adrian Exell** were with me within the hour, armed with samples of Pond Check test kits and Pond Guardian tonic salt.

"The tests revealed that the balance of the pond was acceptable, but closer inspection of my newly-acquired fish revealed the real cause: it was a carrier of both parasitic and bacterial disease. Quarantining the new fish could have very

well prevented my sad losses."

As a result of the swift action, Joe's fish are now apparently looking well, with no further losses following treatment with Pond Guardian, Anti-fungus and Bacteria, and Anti-Parasite.

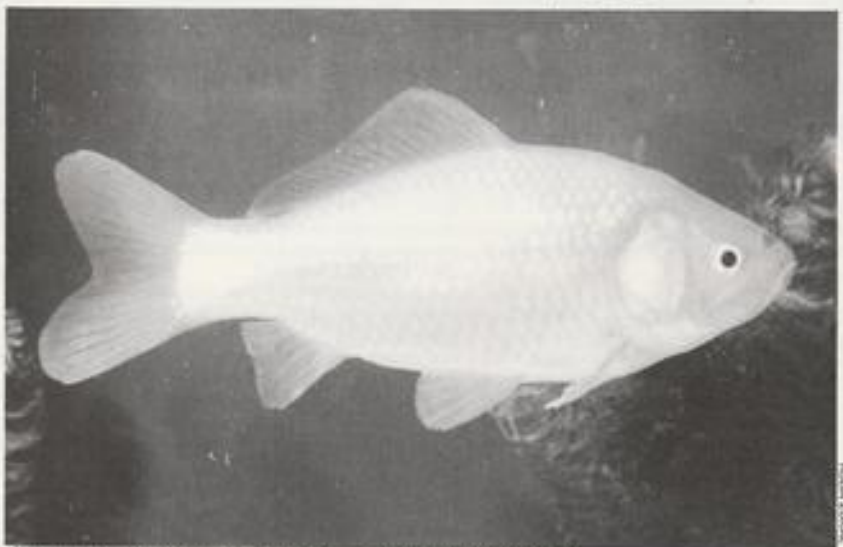
"We don't normally make house calls," remarked **Mike Clarke**, national accounts manager at Interpet. "However, even chairmen of fishkeeping federations can get it wrong, so we were pleased to help."

Joe Nethersell's conclusion: "If, after all my years of fishkeeping, I can still make mistakes, then so can others."

"I was delighted that, on this occasion, someone was able to come to the rescue. However, I do hope that my oversight can serve as a warning to hobbyists that newly-acquired fish should always be quarantined before introducing them to the pond or aquarium."

BKKS SUCCESS

Speaking of Koi, and as the pond season draws to a close, my congratulations are extended to all who were involved in the annual **BKKS National Open Show** held at Billing Aquadrome, Northampton in August. The show was one of the highlights of my summer, and some of the fish were truly breathtaking (we can but dream!).



Common, Primary, Ancestral, Traditional... or what type of Goldfish?

KAROBAR
KOI

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4" - 20"

in 25,000 gallons clear water at
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COVERED SALES AREA



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with a free ticket with every purchase, the prize being a voucher for £250 redeemable for fish of the winner's choice.

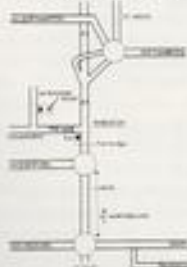
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OPENING HOURS: March to October —
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day, Tuesday and Wednesday.

Approach Wyboston along the North
Bound carriageway of the A1, exit at slip
road to Colmworth directly after foot-
bridge and "Wait for the Wagon" pub.

Despite the appalling weather, the crowds flocked to the event and the venue proved, once again, that it is unbeatable for events of this nature. (For report, pictures and results, see David Twigg's write-up in last month's issue of *A & P*).

FRUITS OF BREEDING SUCCESS

Towards the end of the cold-water season, and before we don our winter woollies and settle down in front of the fire for our own 'hibernation', we can reflect on the successes, or otherwise, of our attempts at breeding our fish over the past few months (don't they just fly by!).

It is at this time of the year that I undertake an assessment of the year's offspring and decide which I shall retain for overwintering. The fish that remain in my rearing ponds have reached a good size — up to around two or three inches — and have been whittled down to a reasonable quality.

Those which I decide not to keep will be passed on to friends and colleagues in preparation for the next season; while those which I have decided to retain, have been moved to deeper ponds to help them better to endure the winter.

This is also the right time to shop around for additions to the brood stock. Breeders will also be discarding their unwanted progeny from this season's spawnings, as well as mature specimens which are surplus to their requirements. Already, specialist goldfish societies will have conducted their annual auctions of fish, which is an ideal source of reasonable quality goldfish; while breeders will have last year's youngster available in perfect condition for overwintering in readiness for next season's spawnings.

My own preference is for British-bred and reared fish, as I feel happier that they will be better suited to the British climate; although I have achieved some considerable success and a great deal of pleasure from some splendid imported specimens.

Whichever you choose, it is wise to quarantine (acclimatise) new arrivals (see *Fish Rescue* Jotting above) and, although I keep my fish outdoors for most of the year, I tend to bring my brood fish to aquaria housed in my garage, at the end of December, before the worst of

the winter weather sets in.

This year's fry will also be overwintered indoors during the harshest winter weather (from mid-January to mid-March), but it is wise to let them feel something of a winter in an attempt to imitate nature, albeit partially.

THERMOSTATS ON TEST

Now that the winter is almost upon us, we return to the debate about low-temperature thermostats to help protect aquaria against frost in the fish-house. Manufacturers have, I feel, been slow to respond to the challenge provided by the requirement of coldwater fishkeepers who keep their fish at low temperatures during the winter, yet wish to protect the aquarium water from going below a certain level.

One manufacturer who has responded, however, is *Carp-tec*, who have sent me samples of their electronic thermostat for testing. I hope to report on the results of my trials in a future *Coldwater Jottings*.

AND FINALLY — GET SCRUBBING!

My annual reminder goes out to all pondkeepers to give the pond a good clean before the winter sets in. In general, it isn't the cold weather which causes losses during the winter, but the toxins released by decaying matter, such as dead leaves, fish mulm, and so on, at the bottom of the pond.

So, remove the fish and plants out of the pond into a clean container (I use an old bath reserved for the purpose), pump out all the water and, having removed the bulk of the dead material, scrub with clean water. *Do not, under any circumstances, use any cleaning agents.*

Having subsequently given the pond a final rinse, re-fill the pond with freshwater, treat with a tapwater conditioner (or leave to stand for a day or so), and return the fish into their clean quarters.

You might also like to take this opportunity to prune, divide, and/or re-pot your pond plants before returning them to the pond. Then, retire to the cosiness of the living room fire and prepare your list of aquatic publications and accessories which you are hoping for in your Christmas stocking!

PRODUCT ROUND-UP

BY DICK MILLS

We kick off this month with a summary of some of the aquatic products which I came across at GLEE, the recent garden and leisure exhibition staged at the NEC in Birmingham.

GLEE REVIEW

Aquarium Systems

All too often in this game, you have a need to shift varying amounts of water for some reason or another. For many years, the top (large-scale) end of such demands has been well catered for, as most pond-keepers will testify. Getting a pump small enough for a small, but very specific job, say creating currents in a marine tank or powering a table-top water feature, well, that was usually more difficult.

The new range of MINIJET submersible pumps from AQUARIUM SYSTEMS now complete the ability to move water from the tiniest flow, to virtually something approaching Niagara! Each of the pumps measures no more than 36 x 56 x 56mm (1.5 x 2.3 x 2.3in) and will move between 75-600 litres/hour (16.5-132gph) depending on model. Entry for power cable and exit for waterflow are conveniently situated on the same side to minimise valuable space occupation.

Also new, are STICK 'N' STONE replica rockwork models for safe (and conservationally-correct) decoration of the aquarium.

Details from: UNDER-WORLD PRODUCTS, Units 1 & 2, Belton Road West, Loughborough, Leicestershire. Tel: 0509 610310.

Rena/Penn-Plax

The popular range of C20 and CV40 WATER PUMPS from RENA have been developed from the basic pump and strainer basket design into the new SI range (SI 20, SI 40). These now incorporate a foam strainer so that the pump can be used in a pond, as well as a standard aquarium powerhead.



The Under-Sea Kingdom Aquarium Kit.

A more powerful model, the S140 TURBO is also available.

The range of HEATER/THERMOSTAT units have been extensively re-packaged for the coming year.

Designs in fishkeeping equipment is often inspired by some quite unconnected theme, and PENN-PLAX have come up with the first and only aquarium to be inspired by a film (no, not *Jaws!*) but Walt Disney's *Little Mermaid*.

The UNDER-THE-SEA AQUARIUM KIT is available in three exciting colours — pink, green and purple — and, needless to say, will appeal to the younger members of the family. Each comes complete with base, hood, airpump and airline tubing, filter, cartridge and flow valve, three plastic plants, ornaments, white gravel, pink accenting gravel, full colour aquarium background, fish food and a *Goldfish Care Instruction Sheet*. Look out for the colourful presentation kits at your dealer's — and just try to get your kids away from them!

Does your youngster want to keep reptiles and amphibians instead? If so, there's another movie/TV-inspired range for these too; it's THE FLINT-STONE'S STONE-AGE TERRARIUM KIT, a complete environment for such animal (plus small dinosaurs!). All you add is the livestock of your choice.

Details of all Rena and Penn-Plax products from the one

address given below, but please mark your queries either Rena or Penn-Plax to assist correct delivery.

RENA U.K. LTD., Bury Farm, Pednor Road, Chesham, Bucks HP5 2JU. Tel: 0494 786759; Fax: 0494 791617.

Algarde

Two new additions to the extensive ALGARDE range of aquarium products are the MINI-HEATER and the AL-500 ELECTRONIC THERMOSTAT.

Not to put too fine a point on things, due to careful design, research and development, you can put the new very conveniently-sized heater (200mm approx in length) where you like; any position or direction (horizontal, vertical or diagonal) makes no difference to its efficiency. Available in four 'sizes': 50, 100, 150 and 200 watts, the heater is fitted with 1.75 metres of cable and comes with a 12 months' guarantee.

The external AL-500 Thermostat can be mounted near to the aquarium for convenience (and less clutter on the tank itself) and only requires its sensing probe to reach into the water for accurate temperature determination and control. It can control two heaters at a time (with a combined total wattage of 300 watts) and has exceptional reliability (no moving parts.)

Available either as a combined pack, or sold separately, the new design packaging makes these two products additionally appealing.

Details from: ALGARDE, Enterprise House, Wharf Road Industrial Estate, Pinxton, Notts NG16 6LE. Tel: 0773 581481; Fax: 0773 581524.

John Allan Aquariums

The concept of amalgamating the variously different filtration methods within a single filter body has recently been taken up by EHEIM's AQUAPULS from JOHN ALLAN AQUARIUMS.

The large internally-fitting box contains three distinct areas, two medium-filled compartments and a reservoir sump holding the return pump. The operation is sequential, but not as obvious as first might be expected, as the entire filter is not always totally 'wet'.

Water enters the filter at two points: the majority at the top, with a smaller portion at the bottom. Once the top section is full, it automatically siphons into the bottom section which, in turn, empties into the sump, from where it is returned to the aquarium via the pump. The cunning design and flow-rate ensures that the compartments have a period of 'dryness' before filling again. This ensures that the bacteria, especially in this top section, are kept under ideal, well-aerated conditions.

A clever ball-valve (very similar to the now old fashioned ping-pong ball type of snorkel-tube safety valve arrangement) prevents the bottom sump running dry. It is recommended that only Eheim's own EHFISUBSTRAT filter med-



ium is used in the two compartments, as the pump's flowrate has been engineered to suit its granule size and resistance to flow parameters. A carbon bag insert is permissible within the pump suction area during installation periods or following medication treatments.

Particular attention has been paid to the mounting of the filter within the aquarium. Reliance on 'suckers' has been abandoned, with two 'drop-in-and-slide-to-the-right' brackets being permanently stuck to the aquarium glass using a supplied template to position them correctly, depending on the design of the tank. This process necessitates first dropping the water level, drying the exposed glass and cleaning it and the brackets with special cleaning cloth (supplied) before fixing; a period of 12 hours should then elapse to allow the adhesive to cure before topping up the tank again.

It is stated that this filter takes half the time of standard biological filters to decompose ammonium compounds.

Full details of this and all Eheim products from: **JOHN ALLAN AQUARIUMS LTD**, Eastern Way, Bury St Edmunds, Suffolk. Tel: 0284 755051; Fax: 0284 750960.

King British

The 'GLEE' display by **KING BRITISH** was made all the more attractive by newly-designed packagings which certainly caught the eye, particularly the range of UNO heating equipment.

One noticeable feature was the 'plug fitted as standard' to the RELIANT heater/thermostat units (one can only hope that a generous amount of cable is also included, as removing a

supplied moulded plug is not allowable under today's electrical regulations.)

Looking forward to winter (?) was the justifiable anticipatory display of Uno's FLOATING POND HEATER, complete with polystyrene buoyancy collar.

Details from: **KING BRITISH AQUARIUM ACCESSORIES**, Haycliffe Lane, Bradford, West Yorkshire BD5 9ET. Tel: 0274 573551; Fax: 0274 521245.

New Technology

Complete freedom of design, coupled with environmentally-friendly materials, is offered with SPRAYDEKOR from **NEW TECHNOLOGY**.

The nearest comparison of the product is to the quickly-solidifying foam which is sprayed into cavities either for insulation purposes or for buoyancy in boat hulls. To create a natural-looking 'rockscape', simply spray the back glass (side glasses, too, if needed) with Spraydekor in the shapes required and, to give it the real natural look, before it solidifies, sprinkle gravel or



small particles of rock etc on to the surface. All manner of aquarium 'hardware' can easily be hidden or disguised.

A new design of PROTEIN-SKIMMER was also on view at GLEE, with large collection cup and counter-current contact chamber. Made from clear and black acrylic, it takes up little space in the aquarium, is ozone-capable and is easily maintained.

The equally easily-installed FISHPEN is a very practical and quick way of dividing an aquarium for breeding, or other isolation purposes.

Still on the equipment front, an INTERNAL POWER FILTER was also on view, but due to its black acrylic construction, a photograph was not practicable.

A small, but very eminently-important, product was a bottle (with associated dosing syr-

inge) of initial BABY DISCUS FOOD, which allows independent raising of fry away from the parents.

Accurate dosing of the aquarium with any appropriate treatment has always been a chancy affair, especially when highly-concentrated additives are required to be used only in 'so many drops' form. NT have moved away from this approach and now, not only supply treatments in handy 125ml bottles with integral measure dispenser, but also colour-code them too - green, red and yellow for aquaria, marine and freshwater usages. All can be easily distinguished by the NEW WAVE name under New Technology's familiar fish logo.

Details from: **NEW TECHNOLOGY LABORATORIES**, 13 Branbridges, East Peckham, Kent. Tel: 0622 871387; Fax: 0622 872331.

OTHER PRODUCT NEWS

Cyprio

They say what goes up must come down, and you could just say that about some of CYPRIO'S pond filters. Usually, such filters are set up in the pondside rockery above the water level, but now several of the popular GREEN MACHINE units (2000, 3500 and 5000 models) have been converted to 'in-ground', gravity-feed options where water is fed to them directly from the pond and then the clean water pumped back to the pond.

The popular BIOFLOC range has been extended by the addition of the 1000 and 2000 models; each of these upward flow filters has foam and Cypri-pak filter media and overhead trays for gravel. The C1000 UV CONVERSION is available for all Cyprio filters up to the 1000 model.

Details from: **CYPRIO LTD**, Eastgate Mews, 131/133 Eastgate, Deeping St James, Peterborough PE6 8RB. Tel: 0778 344502; Fax: 0778 348093.

Bio-Plast (UK)

Following on from recent mention of Berti Gesting's *Nature & Aquarium Booklet* (Books, A & P, September 1992), we have received examples of several BIO-PLAST products.

The THERMO-FLOAT AUXILLIARY HEATER can only be described as innovative (a recent exposure at an aquarist society found that only two members out of around 40 managed to 'suss it out' after a close inspection). Basically, heat is transferred via a 'wrap-around-the-heater' coiled tube which is then laid beneath the gravel using a series of tracked clips before its open end is brought up to the aquarium water once more.



The motive force to drive the warmed water through the sub-gravel tube is provided by an external power filter, a proposition of whose return is diverted to the system via a 'T' piece. The benefit of having warm gravel is that the warmth creates gentle water currents within the gravel which greatly assist plant growth (I'm not too sure how long this extra warmth persists for, say, for instance, when the aquarium heater is switched off by its own thermostat.)

CERAFOAM is a ceramic, and therefore solidly-hard, 'foam' filter medium which provides optimum surface areas (both inside and out) for colonising aerobic and anaerobic bacteria, which results in a more complete water purification. The micro-porous structure not only means that inside-to-outside surface area ratio is 50/50 (these equal bacterial development areas make for excellent control over nitrite build-up and fluctuations in nitrate and nitrite levels), but also allows continuous trickle-through facilities without clogging.

BIOKERN is similarly structured to CeraFoam (with which it makes an even better filter medium combination), but it is made from environmentally-friendly PE-plastic. It can be advantageously used in trickle filters.

Full details of all Bio-Plast products from: **BIO-PLAST (U.K.) LTD, Unit 1, Old Railway Goods Yard, Kildwick Crossing, Crosshills, Keighley, West Yorkshire BD20 7DA. Tel: 0535 630230; Fax: 0535 633690.**

Interpet

As the dark nights draw in, so the tropical fishkeepers begin to stir more actively (well, that's what market researchers think, just before all you warm-water aquarists take up your pens in defence).

INTERPET have signalled this 'official' start to the season by releasing a 'TROUBLE FREE ...' series of five leaflets covering many aspects of the 'indoor hobby' including maintenance of Water Quality, Motor Filtration, Use of Air in the Aquarium, Aquatic Decor and Diseases.

Aimed at both newcomer and experienced fishkeepers alike, these leaflets are not only packed with useful information, but also help to keep aquarists right up to date with all the latest medications and equipment to maintain a healthy aquarium.

Now, the really good news — these leaflets are FREE: all you have to do is send a large (DL size) stamped, self-addressed envelope marked 'Trouble-Free Leaflet' to: **INTERPET LTD, Interpet House, Vincent Lane, Dorking, Surrey RH4 3YX. Tel: 0306 881033; Fax: 0306 885009.**

Lahaina Aquarium Systems

Bring more than a little welcome light to your marine fish and/or invertebrate tanks with a unique range of lighting from LAHAINA.

The METAL HALIDE and FLUORESCENT CANOPY LIGHTING SYSTEMS (REEF LITES) are designed around standard 14-inch wide and 8.5 inches high (35.5-21.6cm) canopies but, of course, various lengths are available to suit your requirements, as are colours other than standard black/brown and white.

Metal Halide saltproof canopies include full-length reflector, control gear and cooling fans, and are available with or without Actinic Blue 03 tubes and High Spectrum 5500K — 175 watt Burners; suspension fittings allow for exact horizontal alignment. Standard sizes are 25, 38, 50, 62, 74 and 96in (63.5, 96.5, 127, 157.5, 188 and 244cm) lengths. Interchangeable Mercury-vapour Bulbs are available at no extra cost.

AQUA-LIFE fluorescent systems for marine use (using Tritons and Actinics) are available in 27, 40, 51, 63, 74 and 98in (68.6, 101.6, 129.5, 160, 188 and 249cm) lengths. The same canopies can be fitted with your choice of tubes to suit tropical freshwater use at no extra cost.

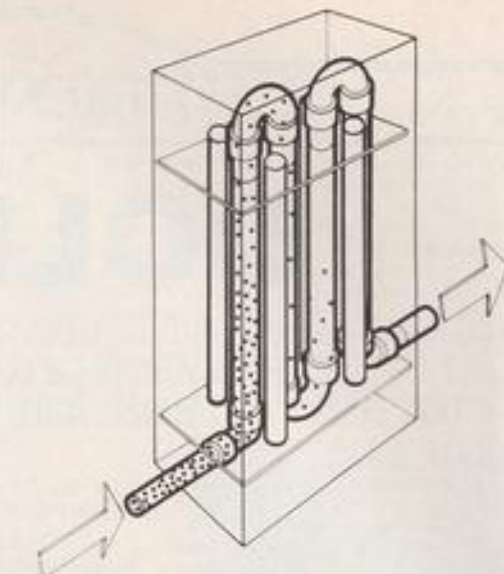
Full details of these British-made Lahaina products from: **LAHAINA AQUARIUM SYSTEMS LTD., 'Lahaina', Kellas, Elgin, Morayshire IV30 3TW. Tel: 0343 89209; Fax: 0343 89296.**

Ultra-Violet Technology

Look out *Domestos*, there's another product with over 99.9% kill rate around!

ULTRA-VIOLET TECHNOLOGY has come up with a **WATER DISINFECTION SYSTEM** using UV lighting which achieves this performance at a surprisingly low cost.

It requires no costly chemicals (the unit's cost is recovered within a year or two) and utilises low-pressure mercury vapour lamps for the generation of UV. The design features claimed do not stop there either, for out goes brittle, costly and easily-fouled quartz



tubes, and in comes unbreakable, fouling-resistant Teflon.

Said to be extremely rapid in their disinfecting effect (3-5 seconds, against 20-25 minutes when using chlorine), the units require low energy inputs, and electronic circuits are fully isolated from the liquids, both for safety and reliability.

Full details from: **ULTRA-VIOLET TECHNOLOGY LTD., Unit E, Laundry Way, Capel, Dorking RH5 5LG.**

H & L Technologies

They say a trip to the seaside to 'take the air' is beneficial, most people believing the smell of ozone to be responsible for the benefit. Actually, the smell is more likely to be that of iodine from decomposing seaweed (although to smell real ozone, the best time is after a violent thunderstorm), but you can see how the connection between ozone and good health has become established.

The use of ozone in the aquarium has a three-fold purpose: it can prevent high levels of organic pollution, kill free-swimming bacteria and parasites, and also maintain the clarity of water. This cleaning capability of ozone, O₃, is due to its extra atom of oxygen (one more than the sort we breathe, O₂) which is easily detached from the basic ozone molecule to 'oxidise' other compounds.

Making ozone is fairly easy, although using it is not quite so straightforward: air from the airpump is passed through a

chamber in which an electrical discharge occurs (the equivalent to the lightning in a thunderstorm) and the ensuing ozone-rich air moves on to the aquarium. Here, it must be used with care, as direct contact with the fish is dangerous and likely to burn them; also, overdosing the air with ozone can cause nausea and also quickly rot any rubber diaphragms or tubing.

The latest **OZONATOR**, recently released from **H & L TECHNOLOGIES**, claims to offer a safe way of providing the excellent cleaning properties without the risks. Ozone is fed into the aquarium via an airstone enclosed in a unit which fits into the uplift of any 'down-flow' undergravel system (using it in reverse-flow systems will simply kill the bacteria in the filterbed). As with any use of air in the aquarium, it is suggested that a non-return valve is fitted in the ozone/airline between the Ozonator and the airstone unit to safeguard against back-siphoning of water into the Ozonator.

The rate of ozone produced is fixed at a safe level (the unit is designed to be used continuously, 24 hours a day) and it is the company's aim that its low cost (around £35.00), coupled with effective results, will now bring previously more complicated (and expensive) equipment well within reach of freshwater fishkeepers.

Full details from: **H & L TECHNOLOGIES, Unit 5, Blaenant Industrial Estate, Brynmawr, Gwent MP3 4BX. Tel: 0495 310799/311602; Fax: 0495 310357.**

Herpetology matters By Julian Sims

GARTER SNAKE REVIEW

As Christmas rapidly approaches, the search for suitable presents begins once again. Herpetologists who are developing an interest in snakes and who wish to keep and breed members of the genus *Thamnophis* might well be pleased to receive a copy of the following new book:

Garter Snakes — Their Natural History and Care in Captivity by Roger Sweeney. This is the latest book on a herpetological topic to be published by Blandford, ISBN 0 7137 2271 1. Price: £12.95.

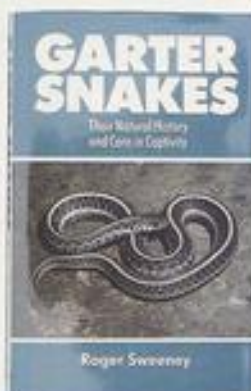
The book contains 128 pages and, in addition to an Editorial Note, Preface and Introduction, the text is divided into three sections.

Part One covers different aspects of the Natural History of snakes in general, and members of the genus *Thamnophis* in particular. These reptiles have a natural distribution from Honduras in Central America, to Canada. Topics discussed include Anatomy (skeleton, digestive tract, reproductive system and skin), Sloughing, Movement, Senses, Feeding, Thermoregulation, Hibernation, Defensive Behaviour, Predators and Reproduction.

Much of the biological information provided in this part of the book can best be described as 'basic' and is to be found in many previously published books on herpetology. However, where possible, Roger Sweeney has given precise information which relates to the biology of Garter Snakes, for example, the annual autumn migration of Red-sided Garter Snakes (*Thamnophis sirtalis parietalis*).

From the late summer onwards, these reptiles can travel up to 3½ kilometres (over 2 miles) in just a few days to return to their chosen hibernation den. Such communal hibernation sites are used by hundreds of Garter Snakes every year.

Part Two of the book deals with Captive Husbandry. Subject headings include Housing, Heating, Feeding, Handling, Health Care and Breeding.



Once again, much of this information is written at a fundamental level, repeating material published in similar books, including other titles in the Blandford herpetological series.

Although Garter Snakes have an extensive geographical distribution, inhabiting some very different climatic regions, the author makes little reference to the specific temperature and lighting cycles required when different types of Garter Snake from different parts of America are maintained in captivity. This is rather surprising, because Roger Sweeney clearly states that the breeding biology of Garter Snakes is highly dependent on the climatic changes which occur in the region inhabited by these reptiles.

Part Three is entitled Species of Garter and Ribbon Snakes. This section of the book contains an identification key for 13 of the 16 species of *Thamnophis* found in North America.

The key is followed by a description and distribution map for the 13 named species, together with descriptions of 41 sub-species. Six species from Central America, which are not generally available to the hobbyist, are also mentioned briefly.

In addition to the 13 maps, the book is illustrated with 19 line drawings and ten colour photographs. Although the majority of these photographs help with the positive identification of four species of *Thamnophis* and four sub-species of *T. sirtalis*, two of the pictures show predators of Garter Snakes — the

California King Snake (*Lampropeltis getulus californica*) and the Roadrunner (*Geococcyx californianus*), a bird which inhabits the south-western United States of America and parts of Mexico.

For anyone who is intending to develop an interest in small snakes and maintain species of the genus *Thamnophis* in captivity, this book will prove to be a suitable starting point. At £12.95, it represents good value.

'LAND' FOR AMPHIBIANS

The name *amphibian* describes the fact that many species from this group of animals can live in freshwater and on land at different times in their life cycle. However, some species of amphibian prefer to live on land for the majority of their life, only returning to water to reproduce.

A well-known example of such amphibian is the European Fire Salamander (*Salamandra salamandra*). This type of habitat selection must, obviously, be considered when maintaining this and similar species in captivity.

Successful maintenance of these species in captivity is complicated by the biological fact that amphibian skin is not 'waterproof'. Therefore, most amphibians have to live in damp conditions to prevent their bodies from drying out.

In common with many herpetologists, I like to use moss and pieces of bark on the floor of the terrestrial vivaria inhabited by salamanders. Not only does such an arrangement look pleasing, but it also provides numerous natural hiding places for the inhabitants.

Alternatively, some herpetologists prefer to use foam rubber as the floor covering for vivaria used for housing terrestrial amphibians. Foam rubber has two principal advantages:

- It is easy to clean regularly, and
- it holds water, thus helping to maintain humidity.

Unfortunately, it does not look particularly attractive. A third group of herpetologists use peat for their amphibians to burrow in. This medium also provides the opportunity to

search for worms and other invertebrate food. However, some forms of peat can be quite acidic, resulting in damage to the skin and even the death of the amphibians.

I would be very interested to hear from readers about their experiences (successes and failures) with the use of different substrates in vivaria used to maintain terrestrial amphibians.

One final note of caution: a terrestrial vivarium must also contain a dish of water or a 'pond' of some type. A rock or piece of tile should be present so that the adult amphibians can climb out of the water easily. Without such help, European Salamanders can drown, even in shallow water.

MARINE TURTLE NAVIGATION

The seven species of marine turtle which currently exist do not swim in the seas and oceans of the world at random. For example, the Flatback (*Chelonia depressa*) is only found in the South Pacific near Australia, and Kemp's Ridley (*Lepidochelys kempi*) remains in Atlantic waters.

Turtles of other species travel much greater distances and are more widespread, but the females usually return to the beaches from which they originated to lay their eggs and so perpetuate the population to which they belong.

The chemical structure of cells removed from body tissue of Green Turtles (*C. mydas*) has been investigated at the University of Georgia, USA. It has been found that the Green Turtles which feed in the waters off the coast of Brazil only nest on Ascension Island. These beaches are more than 1,400 miles away across the Atlantic Ocean — an open expanse of water which lacks any obvious landmarks. The turtles of Ascension are distinct and do not breed with any other population.

Green Turtles which nest at Tortuguero, Costa Rica, are similarly loyal to their beach of origin. These reptiles disperse to feeding grounds throughout the Caribbean as far north as Florida. However, in more than

30 years of tagging experiments, no turtle tagged at Tortuguero has ever been recorded nesting elsewhere.

Turtles have been part of this planet's fauna for over 100 million years. The evolutionary success of these reptiles is partly due to their ability to navigate accurately between rich feeding grounds and their traditional nesting beaches, sometimes hundreds of miles away.

Nesting Loyalty

Unfortunately, this loyalty to ancestral nesting beaches and the return by adult gravid females every two to four years, is one of several factors which is currently contributing to the rapid decline of marine turtles. For example, over-collection of eggs has wiped out some populations altogether, and human encroachment onto other nesting beaches, resulting in noise, lights, vehicles, deck-chairs and propeller-driven speedboats, have all taken their toll.

The loyalty of most female marine turtles to just one nesting beach means that if that population is depleted for any reason, it will not be naturally replenished by individuals from other areas. Conservationists are therefore trying to use the accuracy of turtle navigation to save some of the most endangered populations by moving eggs to protected beaches. Turtles which hatch in these sanctuaries may return there to nest in the future.

Research is also being conducted to discover just how female turtles can so accurately navigate back to the same nesting beach. It has already been established that orientation by the position of the stars is unlikely.

Although many migratory birds use star patterns to determine their position, adult sea turtles are extremely short-sighted when their heads are above water. Thus, they cannot clearly discern stellar configurations at night.

Chemical Sensitivity

It has, however, been established that Green Turtles do detect chemicals dissolved in water. This information might be used in some turtle migrations. For example, turtles migrating from Brazilian waters might detect specific chemicals originating from Ascension

Islands which could act as 'homing beacon'.

Chemical pollution at sea would mask such environmental information, and this is a particular problem in the Mediterranean, which is an enclosed sea. As such, it does not benefit from the dispersing action of the strong currents and tides present in the Atlantic Ocean.

The Mediterranean Association to Save Sea Turtles (MED-ASSET) based in Athens, Greece, has called for further research into the pattern of turtle movements between the Mediterranean Sea and the Atlantic.

Recently, the most significant research into marine turtle navigation has been conducted at the University of North Carolina, USA. Orientation experiments have been conducted using hatchling Loggerheads (*Caretta caretta*) from Florida. (Hatchlings are easier to handle than adult turtles which may weigh 180 kilograms, or around 400lb.)

It was found that, in common with other types of migratory animals, marine turtles use a combination of 'cues' from their environment to help with orientation.

Laboratory Findings

Laboratory experiments proved that hatchling Loggerheads can detect the Earth's magnetic field, as do some species of migratory birds and fish — tuna, salmon and sharks, for example.

However, when these results were tested in the natural surroundings of the Atlantic Ocean, it was found that the young turtles had an overriding response to turbulence, swimming directly into approaching waves, regardless of the magnetic direction from which the waves came.

Experiments with hatchling Green Turtles and Leatherbacks (*Dermochelys coriacea*) revealed that these species can also orientate themselves by detecting the direction of wave movement.

The ability of marine turtles to navigate accurately through the seas and oceans of the world is spectacular. If turtle eggs are transported to hatcheries on 'safe' beaches, then the return of adult females to such imprinted nesting sites might well prevent the extinction of these endangered marine reptiles.

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OUT AND ABOUT

KOI VALLEY

By John Dawes
Photographs by the author



A warm welcome . . . and very spacious undercover Koi sales area, await through this door.

How do you go about getting yourself noticed when other companies who have been established for a longer time than you, already have a loyal following and sell the same product as you do . . . in this instance, Koi? The classic solution is to do something different, of course.

In the case of Koi Valley, this something different starts with the company's advertisement logo itself. Have a look for it in this issue of *A & P*. Notice anything out of the ordinary? Yes, you're right — the Koi in the ad is not pointing in the 'traditional' Koi direction (downwards), but in exactly the opposite one!

A case of shrewd marketing . . . or an oversight? I raised this question with Richard Latter, the manager at Koi Valley, when we visited him recently. Apparently, the answer is a bit of both. When the original artwork was done, the illustrator drew the fish the wrong way round (he was not a Koi keeper). It was soon realised, though, that this was not necessarily a bad thing, so the decision was made to retain the logo . . . and it's worked! At least, it did for me and, from what Richard said, a lot of other people have also had their attention attracted by this simple 'reversion'.

Koi Valley opened its doors at Easter this year, so it's one of our newest Koi outlets. For Richard Latter, this has provided a terrific challenge which he appears to be tackling with great gusto . . . and quite a bit of success. Weekends, in particular, are extremely busy at Koi Valley, keeping Richard and assistant manager, Maxine Mortimer, and staff, on the go providing advice, floating specimens in baskets for customers to examine at close quarters, and generally keeping things flowing smoothly.

On Mondays and Tuesdays,



No-one believes in rushing you into buying anything at Koi Valley. You can take as much time as you like.



Richard Latter displays some very good-looking young Japanese Tanchos.

they close and (in addition to regaining their breath), go about the business of restocking the large behind-the-scenes quarantine/holding area with new fish. All new arrivals are held for at least two weeks in these very spacious quarters (part of which will be redesigned over the winter months and added on to the current retail sales area, with some of the rest, perhaps, being set aside for trade customers).

We visited Koi Valley on a Monday morning after a busy weekend. Stocks were therefore, quite understandably, a little on the low side with regard to some varieties of Japanese Koi. Nevertheless, there was still a pretty good representation of types, sizes and prices, all of which showed that the fish are kept in very good condition, that the assortment is wide, and that the prices are excellent.

I was particularly impressed with some 8-10in Tanchos, some of which I felt had the makings of potential future prize-winners. Even if they never grow up into show-stoppers, you really can't go wrong at a mere £32.50, as one of the accompanying photographs shows.

In addition to Japanese Koi, Richard and Maxine also stock

a large selection of Israeli Koi, with great appetites(!) and very good colour and body shape. Then there are Common and Fancy Goldfish (some of the UK-bred 'Commons' were particularly good), native fish like Orfe, and a modest selection of dry goods which is likely to expand very considerably by the beginning of next season.

The only slight problem we could find with Koi Valley was . . . getting there! However, it's quite easy once you've been there once. If you are a first-time visitor, all you need to do is get to Hadlow Down on the A272 (it's very near Buxted). In Hadlow Down, turn into School Lane, and then take the second turning on the right. Koi Valley is just a short distance into Stocklands Lane.

Opening hours: Wednesday to Sunday — 9.30 am to 5.30 pm (including winter — but ring if you want to make absolutely certain). The shop will also open on Monday or Tuesday (when it is normally closed) by prior appointment.

For further details contact Richard Latter or Maxine Mortimer, Koi Valley, Gate House Farm, Stocklands Lane, Hadlow Down, East Sussex. Tel: 0825 830586; Fax: 0825 830662.



Israeli Koi with a rudely healthy appetite!

Your questions answered

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:

Your Questions Answered, The 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. Discus, Eberhard Schulze. Marine, Gordon Kay

HERPETOLOGY

ONE-EYED FROG

I have a colony of Common Frogs in my garden. When one of my males returned in spring of this year, I noticed that he had only one eye. The eye socket was completely healed but he was very thin.

He disappeared after breeding and I saw no more of him until a fortnight ago when he returned virtually down to skin and bone. I offered him a worm which he managed to catch and eat, and put him in my greenhouse.

Since then, he has eaten a worm a day but, yesterday morning, he regurgitated all the worms in a mass.

What I would like to know is that, being cold-blooded, how long can frogs go between meals? Also, is it worthwhile trying to save the frog, or should I put it back in the garden and let nature take its course?

Amphibia and reptiles should be described as *poikilothermic* or

ectothermic animals. Basically, these two words mean that the body temperature of amphibians and reptiles is *variable*. The body temperature of these two classes of animals (together with fish) changes with, and is, in fact, dependent on, their surroundings. Due to this type of metabolism, these animals are often incorrectly described as being "cold-blooded".

True, on cold days, when temperatures are low, the body temperature of these 'lower vertebrates' is cold. However, on a warm day, some species, for example, Edible Frogs (*Rana esculenta*) and Marsh Frogs (*R. ridibunda*) and many species of reptile, for example, Viviparous Lizards (*Lacerta vivipara*), bask in the warming rays of the sun to increase their body temperature. By mid-day, the body temperature of sun-seeking reptiles certainly could not accurately be described as "cold-blooded". These animals are as warm as

you or I!

There is an immediate benefit for *poikilothermic* animals — they require *less* food than *homoiothermic* or 'constant-body temperature' animals such as birds and mammals. *Homoiothermic* animals 'burn' food to release energy in order to maintain a constant body temperature, irrespective of that of their surroundings. These animals, therefore, need a regular and plentiful supply of food.

In contrast, a *poikilotherm* whose body temperature is dependent on environmental temperatures, only needs about an eighth of the food required by a *homoiothermic* animal of a *comparable* body size.

However, there is also a drawback — although *poikilothermic* animals spend less time hunting for food than their constant-body-temperature counterparts, they remain inactive in cold weather, and they usually hibernate through the late

autumn and winter seasons.

With regard to your one-eyed frog, the fact that it is extremely thin and regurgitates its food indicates that there are also serious internal problems with its organs, probably the liver and gut, or that there is a major infestation of internal (endo-) parasites.

From the symptoms which you describe, and the above diagnosis, there is, unfortunately, very little that you can do to save the life of the frog. However, I would recommend that you keep it in your greenhouse throughout the winter to protect it from the extremes of temperature. Very low temperatures will hasten its death.

Provide a *shallow* dish of water in which the frog can sit and soak so that it does not become dehydrated. A weak amphibian can drown in deep water. Regularly change the water to ensure that it remains free from ice.

PLANTS

LILY CROWN ROT

I've been struggling with my pond all through this past season. For example, my water lily has looked quite healthy (at least, when the new leaves have been produced). However, these have very quickly changed colour and gone black and slimy every time. What is the problem?

It sounds as if your water lily is suffering from Crown Rot. This is a disease which involves the progressive rotting of the

rhizome from the severed end. I am afraid that your plant

will almost certainly fail to sprout next spring. I suggest



In a healthy lily rhizome, such as this one, the tissues are hard and the new growths for the following season (one is being pointed out) look and feel 'healthy'.

that you remove the plant from its container and wash off all the soil. You will probably find that the rootstock is soft and mushy. With a sharp knife, cut the rhizome off in slices until you come to healthy white tissue.

If you have a cold greenhouse, float the rhizome in a bowl of clean water until May of next year, when, if new healthy white roots start to grow, it should be safe to replant the lily in fresh soil. If the whole rhizome is rotten, then you will have to write the plant off.

TROPICAL



Above, the Blood-red Parrot. Breeding is now being achieved by a growing number of aquarists.

BREEDING PARROTS

I've recently bought three of the new Parrot Cichlids. They seemed to get on all right at first but, one morning, I found one of them dead. The other two were busy digging in the gravel but didn't lay eggs.

I moved them to a separate tank by themselves and, a couple of days later, found that they had spawned. However, next time I looked, all the eggs had disappeared.

Any information you can supply would be gratefully received.

The new Red (or Blood-red) Parrot Cichlid is, indeed, so new that there are no breeding details published. However, a few owners have reported successful breeding and they say the fish is a classic substrate cichlid spawner.

This is one more piece of evidence that the fish is not some new F1 hybrid, but a mutant of the Severum. As such, the normal breeding recommendations apply, i.e. sandy base is best for digging a nest; leave the parents with the eggs and family.

All you can do is hope they learn to be good parents with time.

[See also Letters page for further news about this fish. Ed.]

'ELECTRIC' FISH WIDOW

Please, please, please help me! I know you are not Marriage Guidance advisers, but I'm afraid I am a 'fish widow' who is locked in a battle with my better half over the electric bills. Over the past year, they have gradually increased and I have been cutting down on my consumption. I have made redundant a convector heater and one or two other small items, but the bills are increasing, as are my husband's quantity of tanks!

What I would like you to do, if possible, is to advise me as to how much his tanks are approximately costing to run. Obviously, they do not use as much heat in the summer as they do in the winter, so perhaps you could give me an idea as to a summer cost and a winter cost.

His tanks are tropical, so, presumably, they are warm water (I honestly have no interest, so I don't know temperatures, etc). He has two 4ft (120cm) tanks in the house, with heaters and a pump with each. In a shed in the garden (which does not have any heat of its own) he has a further five tanks with five heaters. All seven tanks are in use all the time. As to the gallonage in the tanks, again, I do not know, but as I have said, they are 4ft long and about 18-20in (45-50cm) deep.

Electricity costs about 6½p per kilowatt every hour. The average aquarist has 150 watts of heaters, 14 watts lighting and

12 watts of pumps, which totals 176 watts, which will cost 1.14 pence per hour. However, heaters only operate part of the time, so it is generous to say 1p per hour. This is £20 per quarter.

Resiting the aquarium to a warm living room will cut this cost by anything up to 50% because the heater will only operate briefly, and it is the heater that is the main user of power. Lagging the back and sides of a tank with polystyrene (ceiling tiles) can also cut costs further.

Note that even a large aquarium (such as your 4ft) with all possible accessories, will cost around £5 a week to run, which is a cheap hobby compared to drinking, smoking or gambling!

A fish-house, however, can be expensive if the lagging is not effective, especially in the

winter. £50 a quarter is normal, down to £30 in summer. Some aquarists use paraffin heating, with daylight lighting (glass panels in the roof) to reduce costs of fish-houses to just the air pumps, etc (say, £10 a quarter, plus fuel costs).

For minimal costs, set up a Fancy Goldfish tank where, if maintained by partial water changes, just the cost of a fluorescent light (pence per week) and food is needed.

A coldwater tank could house semi-tropical species such as Blue Acara, Butterfly Goodeid, Climbing Perch, Dwarf Cichlid, Blind Cavefish, Rosy Barb, Ticto Barb, Bronze Catfish, Argentine Pearl, Mosquitofish, Paradisefish, Weather Loach, White Cloud Mountain Minnow, even Guppies if the room never gets very cold, all at a running cost of about £1 a week.

KOI

pH COLOUR 'BREWS'

Everything I read warns me about the dangers of high pH levels. My Koi pond pH level is 8.5, and the water out of the tap is only marginally better. Do I resort to the use of some 'brew' to lower the pH of my pond and, if so, which 'brew' would you recommend?



An outstanding 61cm Yagosen Kohaku. Do any A & P readers have direct experience of brilliant reds (such as that possessed by this specimen) being influenced by high pH levels in the pool water? If so, we'd love to hear from you.

I would also like to know what, if any, are the dangers of prolonged high pH levels on Koi. I have heard that such conditions can affect coloration (mainly blues and reds). Is this so?

I think you could well be worrying needlessly about the effects of pH on your Koi as, although 8.5 is a little on the high side, it should nevertheless still be a tolerable level for your fish. There have been documented cases where Koi have eventually become acclimatised to a level of more than 9.5 without ill effect.

I would not advise the use of chemical 'buffering', as any reduction should have to be strictly stable; otherwise, the effect would cause more stress than the actual problem itself!

I cannot say for certain that the prolonged effect of a high pH would significantly alter the colours of Koi, although I wouldn't have thought so. I do know that lower temperatures improve coloration, but have no knowledge with regard to pH.

I trust that the information provided will, at least, put your mind at rest and prevent any undue worry on behalf of your fish.

MARINE

'42-inch' LOSSES . . . AND COLOURED ANEMONES

We currently have a 3-gallon (13.6 l) acrylic hexagon tank with just an airstone for keeping the livestock and bacteria healthy. Within the tank are old corals and one algae-covered rock for grazing a Bicoloured Blenny. He is very happy and this tank only gets one water change a month as usual.

Previously, we kept a 42 x 18 x 20in (105 x 45 x 50cm) tank with Tunze filter and skimmer. This had living rock and corals kept under metal halide lighting. We had several fish, including a pair of African Clown, grown on from young stock. They proceeded to spawn later on in the year on a regular 12-17 day cycle. We tried to raise the fry but, owing to pressure of work, we were unable to devote the time required to be successful.

The miniature reef successfully survived for 1½ years. We lost the entire stock after a water change of 4-5 gallons (18-23 litres) even though the water was dechlorinated and salt added to the correct specific gravity, and heated for 2-3 hours. Within an hour of topping up with 2-3 gallons (9-14 litres) the corals were seen to send up a stream of bubbles. Within 36 hours the tank was barren; even the living worms in the rock floated out, quite dead.

The only survivor for a little longer, was a lone Mantis Shrimp, tapping out the reef's last message.

We were never able to trace the source of the copper in the mains water supply that week. Thankfully, some of the fish survived due to quick action, removal and transportation to our local supplier, the World of Fishes at East Grinstead, who kindly looked after them until those that were able, recovered and were re-sold.

The state of tapwater in the UK appears to be deplorable in certain areas, with nitrates, phosphates and heavy metals being major nasties. If it is fit for human consumption, it should also be fit for the care

of our aquatic creatures.

We would appreciate your comments. We would also like to know your view on the practice of treating anemones with food colouring to make them more attractive to potential customers. The anemones simply die slowly from such treatment.

The above are some of the main points raised in a letter received from A & P readers John and Sarah Ashwood. Unfortunately, as you didn't supply us with your address, I am unable to respond to you directly, either with regard to the above points, or the others that you raised. I hope, though,



Anemones, whether with resident Clownfish or on their own, are attractive enough without artificial colour additives, aren't they?

that you are reading this.

I found the paragraphs on your aquaria interesting, although I personally wouldn't countenance keeping marine animals in a three-gallon aquarium — especially one that is run on the 'Natural' System.

With regard to your 42-inch aquarium, the reason for your losses is anybody's guess. It would seem that your diagnosis of poor quality tapwater would be correct, as I do know that tapwater in some parts of England is particularly bad. If I were you, I would treat your tapwater, maybe with a deioniser or similar, before use.

You make reference to tapwater being fit for human consumption. Well, tapwater for humans to drink is the top priority of the water companies and it is, to be fair, none of their concern if we choose to keep animals in it.

However, I do not wish to be seen to be slugging off water companies and so we will end my letter there, except to say that I do not have direct experience of any dealers who treat anemones with food colouring. However, more anemones probably die through lack of light and the consequent loss of their light-requiring zooxanthellae than through the ingestion of food colouring.

COLDWATER

BLACK LIONHEAD I.D.

I have recently bought a fish from my local dealer which, I have been told, is quite rare. I believe it is a Black Lionhead. It has a black body with a bronzy colour underneath. Its tail fin is double and about 1½in (3.8cm) long. It also has a good head growth.

Do I really have a Black Lionhead . . . or is it something else?

It sounds very much as if the fish you have is, indeed, a Black Lionhead or Black Ranchu. Although these fish are quite rare, they are occasionally offered for sale. They are usually imports, as only one or two amateur breeders in this country are specialising in this

particular variety of goldfish.

Such fish have a tendency to change to orange in later life or if the temperature they are kept

at is on the high side. In the past, this was a problem with Moors, but due to the strains being well established over



Black Chinese Ranchu (Ranchu have a more highly curved back profile than English-type Lionheads). Most fish will tend to develop some bronze coloration on the underside as they approach maturity.

many, many years, it is less likely to happen in modern-day Moors.

It is also possible that your fish did not even come from a true-breeding Black Lionhead variety because, in all metallic strains, the fish go through stages of change before they reach their adult gold or silver coloration. In the initial stages, the colour is olive-green, which darkens, often to black, and takes on the velvety texture before paling from the underside as it begins to change to the adult metallic colour.

Lionheads are one of my own particular favourites. I have been keeping them for many years and hope that you will get as much pleasure from your fish as I have had from mine.

Focus on: *Cichlids*

A BITE TOO FAR

"Oscars, large and small, are big eaters. In fact, they are downright gluttonous. Sometimes their excesses in consumption give them serious digestive upsets; Oscars even have been known to die as the result of eating too much."

This interesting snippet of information comes from *Oscars* by Neal Pronek published by TFH Publications Inc. I wish I'd read the book before purchasing my Oscar. I had heard that Oscars are known as the Dobermanns of the fish world, but the lin long chocolate and orange baby swimming around the tank looked so harmless.

I had gone to the shop to buy stock for a community tank I'd set up at work (a mental health drop-in centre). I decided on some Zebra Danios, Penguin Tetras, Tiger Barbs — and the dear little Oscar. I hadn't meant to buy him (I've always thought of it as a 'he'). I knew perfectly well that he wasn't at all suitable for a community tank — so why did I do it?

The answer — I had a very persuasive friend with me. He was heavily 'into' cichlids, the bigger the better. His argument for buying the Oscar was that when he got a little larger and outgrew my tank, he could transfer to his empty 4ft (120cm) set-up. This sounded perfectly reasonable.

The Oscar joined the others in the 'work' tank and the centre members were intrigued by him. He was so friendly, he seemed much more of a pet than the other fish. If you ran your finger along the front of the tank, he would follow it. We all agreed that he was a very intelligent fish.

The story of Oski — Fiona Thompson's Oscar that, obviously didn't know the meaning of commonsense!

Photograph by the author

Fall From Grace

He fell from favour the day we discovered him with a Tiger Barb in his mouth. I managed to extract it with no harm done and decided that the time had come for Oski to be moved to his new home. I got in touch with my 'friend', only to find that he'd just put a pair of large aggressive cichlids into his 4ft tank and no longer wanted Oski.

The sensible thing to do at this point was to take Oski to my local fish shop and swap him for some community fish. Unfortunately, I'd made the big mistake of growing fond of the little devil. I ended up taking him home to my 'Community Cichlid' tank. This is an odd set-up that seems to work — somehow. It comprises, in a 3ft (90cm) tank, a Doradid Catfish, a Keyhole Cichlid, a Red Tail Shark, a Pictus Cat, a Banjo Cat, a Kribensis, a Plecostomus, a Banded Severum and two Corydoras. None of them are fully grown. The Doradid is the largest at about 4in (10cm), followed by the Severum at about 2.5in (6.4cm). In retrospect, I should never have kept such an assortment in a tank of such small dimensions, but it was set up in the first ill-informed days of my new-found passion for fishkeeping.

New Relationships

Oski settled into the pecking order of the tank remarkably well. There was an ongoing squabble with the Severum (who was tank 'daddy') but as there were no ripped fins or signs of damage, I wasn't too worried. I felt Oski would be quite content in his new home until I could find a fishkeeping friend prepared to offer him more suitable tank space, or I could persuade my mother to let me set up a new tank. She really enjoys the fish but has set the limit at my two 3ft set-ups.

Oski's personality really started to develop. He had a voracious appetite. I feed my fish on 'Aquarian' Flake, occasional cichlid pellets and live *Tubifex*. If I'm feeling

really brave, I'll dig up some earthworms from the garden or buy some liver and chop it up for them. They enjoy worms and liver most of all but, as I am a vegetarian, I find it really horrible to prepare these delicacies. I also feed them peas and lettuce which they like very much. I have thought of giving them a completely vegetable diet, but I can't, as a vegetarian, force my diet upon them!

Operation 'Cory'

Things ticked over in the tank very nicely for several months. Then, one morning, I found Oski with my favourite *Corydoras* jammed headfirst down his throat. The Cory was obviously stuck, with Oski unable either to swallow it or spit it out. This was not going to be as straightforward as 'Operation Tiger Barb'. *Corydoras* have the ability to raise their dorsal and pectoral fins (which are very spiny) and 'lock' them in position. This practically doubles their size and makes them an extremely difficult meal to swallow.

You would have thought that a fish as intelligent as an Oscar would have had the sense to leave well alone. Obviously, my Oski was not as intelligent as I'd thought. Not sure of how to deal with the situation, I phoned my local fish shop. They have always been very helpful in the past. They were very concerned, but also not sure of the best course of action to take.

After I agreed that it really was very silly to have an Oscar in the tank, we decided that the best thing to do was monitor this situation for a while and, if Oski seemed to be getting distressed, attempt a manual removal. Oski was floating around the bottom of the tank with his eyes bulging out of his head, but he didn't seem unduly disturbed. He managed to spit the Cory out in the five minutes I wasn't watching the tank.

Looking through some back issues of *A&P*, I found another reader who had experienced the same problem (Jan Thompson — no relation — Yeovil, Somerset, February 1990). Dr David Ford had replied that he felt Oscars and *Corydoras* could be kept together, as he had done this for many years with no problems. Maybe Dr Ford's Oscars are more intelligent than my little Oski.

Oski seems to have suffered no ill-effects from tangling with the Cory, and I'm still looking for a new home for him. Don't be put off from offering a new abode because of his eating habits. I'm convinced he just suffered a momentary brainstorm due to shock from the day he jumped out of the tank at feeding time and had to be retrieved from the carpet in a jug — but that's another story!



Oski photographed during his 'Cory' episode.

Focus on: *Cichlids*

BREEDING: THE BLUE DOLPHIN CICHLID

William Ross describes his successes with, and theories about, the spectacular Malawian *Haplochromis moorii*.

Photographs by the author



A fully mature Blue Lumphead male with the distinct cephalic hump which is responsible for the species' common name.



Non-brooding female. Note the distinct eye-bar.

This beautiful maternal mouth-brooding Cichlid from Lake Malawi, was first described by Boulenger in 1902 as *Cyrtocara moorii*, a name by which it is sometimes still referred to in aquarium literature. The common name of Blue Lumphead adequately describes the appearance of adult specimens of this fish; they are a beautiful overall blue colour, with a pronounced hump on the head as can be seen by the accompanying illustrations. According to Goldstein (1973), the genus *Haplochromis* Hilgendorf, 1883, is the largest genus of the family Cichlidae. It is into this genus that the subject of this article has now been placed.

In March, 1990, I purchased four juvenile *H. moorii* from a local dealer. These were captive-bred specimens imported from Singapore. The four fish were housed with a pair of Gold Kribis, *Pelvicachromis pulcher* (Boulenger, 1901) in a 76 x 33 x 38cm (30 x 13 x 15in) deep aquarium with undergravel filtration. The tank was planted with *Hygrophila* sp and a plant pot was used as a cave by the Kribensis. Temperature was maintained at 25-27°C (77-80°F).

SEXUAL DIFFERENCES

The fish were fed on a good-quality flake food and on this they grew fairly quickly, becoming sexable by the end of May. There was one female and three males. For sexual differences see the accompanying pictures which were taken approximately five months after purchase. Three months later, the males' cephalic humps were much more pronounced. The males were approximately 11cm (4.25in) in length at this time, while the female was about 2cm (0.75in) shorter. Both sexes develop cephalic humps, the dominant males having the largest humps.

Wickler (1966) points out that in the genus *Haplochromis*, 'egg dummies' occur on the anal fin of the male. In such a large genus, it is not surprising that all the species do not conform with Wickler's findings, as *H. moorii* lack the anal spots.

Dominant adult male Blue Lumpheads are an overall blue colour with darker bars on their flanks. Aggression is shown by a deepening of the colours and body wagging towards the opposing male. This may lead to an attack, but seldom is any injury sustained. Usually, the dominant male chases his adversary away and the submissive fish loses its dark bars and becomes 'blotched'.

As found by Leong (1969), Heiligenberg, Kramer and Schultz (1972) in their extensive study of *H. burtoni*, the black eye-bar which runs from the posterior end of the mouth to the eye on males is the decisive characteristic in determining and triggering off aggressive behaviour.

In the illustration of the female Blue Lumphead, it is noticeable that there is a similar eye-bar, but it is lacking in the male. This eye-bar on the female is present on both



Above, the eye-bar is still present in brooding females. Note the distinct 'chin pouch'.

Right, when danger threatens, the fry rush back into their mother's mouth. One specimen is doing precisely this in this shot.

Centre right, a fry at 33 days post-release from its mother's mouth. Note the characteristic bright yellow anal fin.

Below right, juvenile Blue Lumpheads beginning to show typical adult coloration.

non-brooding and brooding females.

It is also noticeable that an unstressed female has darker bars on her flanks. When stressed, these fade and she becomes mottled with dark blotches similar to a submissive male, but the eye-bar remains. As female Blue Lumpheads show minimal aggressive behaviour, there was no definite link between the eye-bar and aggression demonstrated. Further, as non-brooding and brooding females show the eye-bar, it is unlikely that it is linked to brooding, such as is found with the warning colours of the Mozambique Mouthbrooder, *Oreochromis mossambicus* (Peters, 1852) I described in 1986. There is a possibility that the dark eye-bar may be used by the fry to orientate towards their mother's mouth.

BREEDING

The four Blue Lumpheads were left together in the above-described tank. One male achieved dominance over the other two

after many aggressive displays and skirmishes. This male then prepared a shallow saucer-shaped depression in the gravel.

There was much activity between the dominant male and the female as he circled her and displayed by body wagging in front of her. After about 48 hours of this activity, the female was seen to have a distended lower jaw and was obviously brooding eggs.

For the next week, the dominant male slightly harassed all the fish, including the brooding female, with no ill effects. He then prepared another nest and became very aggressive. All the fish, except the brooding female, were therefore transferred to another aquarium where their activity returned to normal.

On the 17th day after spawning, the female released 9-10 large fry. When threatened, she appeared to give a signal and the fry would return to the safety of her mouth. Approximately 50% of the fry swam with a 'head up' attitude and sank to the bottom



of the tank, when not actively swimming.

By the fifth day after release, only five fry remained; these swam normally and the female continued to brood them for another six days. The mother was left with the fry until the 32nd day post-release.

The fry were fed on a proprietary fish food that contained dry plankton. This was then followed by the same flake food as used for the parents, which was crushed to suit the fry. They have grown well on this diet, as the picture of a 33-day post-release fry shows (note the yellow anal fin). The anal fin becomes yellow soon after release and fades at about the time the fry start to develop their blue body coloration.

FURTHER SPAWNINGS

This was possibly the first spawning by this pair of fish. The second spawning followed the same pattern as the first, with the fry being released on the 15th day and being brooded for another ten days. There were approximately 28 fry in this batch and all appeared normal.

The third spawning was similar to the previous spawnings. This time the female was moved to another aquarium on her second day of brooding. During this operation, she did not appear to drop any of her eggs and finally produced somewhere between 40 and 50 healthy fry.

Being short of aquarium space, the female was left with the fry. Fifty-seven days after her last spawning, she laid more eggs which

she brooded for two days; then they disappeared, presumably eaten.

EGG-EATING THEORY

This phenomenon of mouthbrooding females laying eggs and brooding them without the presence of a male, was something I reported for *O. mossambicus* in 1985. I put forward the hypothesis that this is a safety mechanism.

In the wild, these two species of fish inhabit fairly open waters, where the males prepare nests in the substratum, into which they entice receptive females to spawn. In the event of a ripe female becoming isolated from the males, she would run the risk of becoming egg-bound, possibly leading to sterility or death. The egg-brooding phase terminates either because the female receives, or does not receive, a stimulus which makes her aware that the eggs are not developing. In eating the infertile eggs, she conserves the protein in them.

It is accepted that the evolution of mouthbrooding in cichlids has followed two main lines, i.e. that found in *Tilapia* (including *Oreochromis*) and that in *Haplochromis*. Although these lines differ morphologically, it appears that, apart from mouthbrooding, some of the species share similar behavioural traits, as noted by the brooding of non-fertilised eggs by both Mozambique Mouthbrooders and Blue Lumpheads.

For the aquarist acquainted with, and interested in, the behaviour of mouthbrood-

ing cichlids, I can recommend *H. moorii*. There are many questions about its behaviour which have still not been answered; e.g. Does the eye-bar on females have a function? What is the reason for the yellow anal fins on the fry?

Blue Lumpheads, with their low aggression, size, ease of maintenance and breeding without the usual gravel shifting and plant destruction of some other cichlids, has a lot to recommend it to the advanced beginner in the aquarium hobby. **ASP**

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Focus on: Cichlids

THE CHALLENGE OF THE LEMON CICHLID

It may not be the easiest African cichlid to keep or breed, but, as **Mary Bailey** shows, *Neolamprologus leleupi* is a highly desirable species in numerous ways.

Photographs by the author



A community scene including a Lemon Cichlid (top/right center), showing suitable rockwork.



Fully grown *N. leleupi* male of exceptionally dark colour.

When I first became involved with cichlids in the early 1970s, both Malawi and Tanganyikan species were generally regarded as the next best thing to impossible. The passage of time has, however, seen numerous Malawian species firmly established, with many readily available as tank-breds, and many ordinary fishkeepers not only aspiring to keep these 'difficult' fishes, but also succeeding with them. Once the basic problem of a rather over-boisterous character has been overcome, breeding is, in fact, rather too easy!

The same cannot be said for Tanganyikans at all. Although *Neolamprologus brichardi* — the Lyretail Lamprologus — has achieved the position of an established fish, readily available almost everywhere, it is quite unusual to find a shop stocking other species in 'locally bred' form; most tank-breds seem to have been imported from Europe. This problem can, perhaps, be attributed to the need for considerable attention to detail and a remarkable amount of

patience in order to breed many species, but even fishkeepers amply endowed with both of these seem to find the subject of this article, *Neolamprologus leleupi* — the Lemon Cichlid of some American literature — far from easy to breed.

This is a great pity, as it is an inoffensive and extremely beautiful species, deserving of greater popularity — which it cannot easily achieve while availability is so limited. This, of course, limits the possibilities for attempting to breed it, and so we go round and round in circles. . . . Hopefully, this profile of the species will set any aspiring breeders on the right track for success and help to remedy the situation.

'LEMON' TAXONOMY

First a few words on taxonomy (even, if you regard this subject as dull and irrelevant, please do read on, as it is very important in this case). Three different forms have been examined by scientists and assigned to different subspecies. The typical form, *N. leleupi leleupi*, is a yellow-orange fish; *N. leleupi melas*

is, as the name suggests, a melanistic form with a considerable amount of black(ish) pigmentation producing a rather dull charcoal-coloured fish. Professor Max Poll (1986) re-examined both forms and considered *melas* to be simply a colour form of *leleupi*, as there are no other appreciable differences.

The third form, originally described as *N. leleupi longior*, is considered by Poll to be a distinct species and thus properly termed *N. longior*. It has different body proportions and is consistently medium orange (while *leleupi* is lemon to pale orange).

To the unpractised eye there is not much, if any, noticeable difference between the two species. To confuse the issue yet further, Ad Konings has reported (1988) finding other very similar fishes not yet examined by scientists.

It is, thus, apparent that we have here a complex of forms or species which are undoubtedly descended from a common ancestor, and that further study will be needed before we can say with certainty whether they are forms, subspecies, or full species. Whatever the answer, we should take considerable care to avoid cross-breeding, which, assuming it to be possible at all, will produce 'mongrels' of indeterminate type.

These various forms/subspecies/species are found in different areas around the lake (as far as is known, no two types are sympatric, i.e. found in the same place). This may be the result of a single population fragmenting during migration at some point in its history, perhaps when moving to habitats newly created by a rise in the lake level (this

phenomenon is covered in more detail in a new book on Lake Tanganyika cichlids by Konings and Dieckhoff, in press at the time of writing).

Alternatively, they may be relics of a more widespread population that has been ousted from some areas by better adapted species, leaving widely separated fragments, with these relict populations evolving separately thereafter. This view is, perhaps, supported by the apparent greater success of the *melan* form (and other darker types and related species, e.g. *N. cylindricus*). An obvious advantage of the less spectacular coloration is the lower susceptibility to predation in a well-camouflaged fish.

AQUARIUM REQUIREMENTS

Rocks

Whatever the reasons for the distribution pattern, all populations have one major feature in common: a liking, or rather, a requirement, for rocky habitat with plenty of nooks and crannies to offer refuges and breeding caves. This requirement must be considered of paramount importance when creating an artificial environment for them. Large quantities of rocks and stone should be heaped in piles, with as many small interstices as possible for hiding places.

This species is not a great digger, so undermining is unlikely, but even so, it is sensible to base the 'foundations' firmly on the bottom of the tank (or the filter plate).

Water Chemistry

Water should be as for all Tanganyikans: temperature about 80°F (c. 26.5°C); hard if possible (though this is not critical, and it is better to have soft water than to play with chemical adjustment); and with an alkaline pH. This is absolutely essential, as a pH below neutral will result in ill-health and rapid death. In consequence, it is advisable to include some calciferous material in either the rockwork (limestone) or the substrate (crushed shell, coral sand, dolomite chippings) to act as a pH buffer. This will also have the longer-term effect of hardening the water somewhat.

Coral Sand

In passing, I should mention what I regard as undesirable: the practice of using a substrate composed 100% of coral sand. This may look very nice to you, and undeniably there are light-coloured substrates in Lake Tanganyika. In the lake, however, there is a considerably greater distance between the light source — sunlight passing through the water surface — and the bottom in the areas which the Lemon Cichlid inhabits, especially as it is often found at fairly deep levels. This means that, in nature, it is not subject (or subjected!) to the glare caused by a fluorescent tube suspended a couple of feet above a gleaming white substrate.

A further problem with a coral sand substrate is what appears to be irritation (mainly to the gills) caused by minuscule



A young *N. longior* (or *N. leleupi longior*) male, still rather pale in colour.



Another beautiful *Neolamprologus* (*N. buscheri* — the Striped Lamprologus) a rock dweller which is suitable for a Lemon Cichlid tank.



Julidochromis regalis affinis (one of the Striped Julies) is a good subject for a 'leleupi' community.

particles of coral which are easily stirred up and may remain suspended for some time. This can be a serious problem in Malawi tanks where digging is more rife, and I have lost count of the number of times I have seen 'coral-substrate-Mbuna' scratching themselves silly on their rockwork.

The problem is less serious, but still a problem, with Tanganyikans — the more so as they can be rather delicate physically. Accordingly, it is far better from all points of view to mix 10-25% coral sand with ordinary gravel; the colour is more acceptable, and the

tiny coral particles sink well into the gravel bed, where they do no further harm. It is also a lot cheaper!

Water Quality

Water quality should be perfect — Tanganyikans may (but not necessarily) survive for some time in less than A1 conditions, but they are likely to spend their lives with folded fins and dulled colours, circumstances under which breeding is totally unlikely.

Any apparent ill-health should result in a rush for the test-kits, rather than the medicine cabinet, and any concentration of nitrate higher than near-zero remedied with immediate partial water changes. In these days of high levels of nitrate in tapwater in some areas, the quality of the replacement water must be strictly monitored as well.

Obviously, regular water changes (with the above strictures regarding new water quality) will serve to keep the tank fresh and pure. These, however, need normally be only small (10% weekly), as Tanganyikans are usually kept at a low population density, with a low pollution rate. Likewise, the filtration method is not critical, though this should provide a good level of oxygenation, supplemented, if necessary, by additional aeration.

Tankmates

The mention of population density brings me to the next point. *N. leleupi* can be kept either as part of a community of small(ish) rock-dwellers, or in a single species aquarium. In either case, plenty of territorial space should be allowed: say, a 24 x 15 x 15in (60 x 38 x 38cm) minimum for a pair, or a 15-18in (38-45cm) long area in a larger tank.

If the community situation is chosen, then other small rock-dwellers are the ideal tankmates — other *Neolamprologus*, *Julidochromis* (Julies), *Telmatochromis*, etc. One breeder has reported greater success in this type of situation than with a single species set-up, where the *leleupi* appeared nervous and failed to settle to breed. Other fishes will not be allowed into, or near, the breeding cave(s), but will not be harassed, as long as they keep their distance.

Diet

In nature, the Lemon Cichlid feeds predominantly on small crustaceans and invertebrates, and an ideal aquarium diet will contain large amounts of similar foods in either live or frozen form (a word of warning here; a friend has found the use of live river shrimp leads to horrendous — albeit short-lived — increases in nitrate levels). This diet can be supplemented with finely prepared heart, prawn, mussel, etc, and a modicum of flake.

Please do not, however, expect this species to thrive and breed on a diet of dried foods alone. Proper diet, and liberal feeding, should be regarded as prerequisites of successful breeding, especially when trying to trigger that elusive first brood.



The elegant — and appropriately named — *Altolamprologus calvus* (the Pearly Lamprologus) — another suitable 'leleupi' community possible.

N. cylindricus is believed to be closely related to *N. leleupi*. Note, for example, the similar body shape.



BREEDING

Obtaining Pairs

A problem that can arise is actually obtaining a pair of Lemon Cichlids; even to the practised eye, there is little difference between the sexes. Males eventually grow larger, while females are slightly fuller-bodied. Males also tend to have a longer snout. But if you do not know the relative ages of a group of specimens, it is easy to imagine non-existent differences.

As with so many cichlids, the ideal solution is to buy half a dozen juveniles, but here we have the continuing problem of availability. If money is not a major problem, and you have a large tank, the answer is to buy four to six wild fishes.

Once a pair has formed, they should be given a tank of their own, or else the spares should be removed, to avoid any temptation towards genocide when breeding begins. If, however, you are one of those lucky people with a 72in — 180cm (or larger) tank for your Tanganyikan community, then this would provide an interesting opportunity to study the behaviour of a group of adults in a semi-natural situation.

Spawning

Many Tanganyikan species have two breeding strategies: 'trickle spawning', where batches of a few eggs are laid a week or so apart, and the more 'normal' cichlid procedure of producing a large spawn at longer intervals.

Sometimes, a pair will utilise a single strategy throughout their breeding life together, and sometimes they may alternate — for reasons quite unknown to us. *N. leleupi*, however, appears (at least from the data available) to practise only the 'normal' strategy.

Up to 200 whitish eggs are laid in a

suitable crevice. The male remains outside on guard for most of the time (during spawning and subsequently), making brief visits inside to fertilise the eggs and later on to check on the progress of the brood. The eggs are tended by the female for three to four days, and mouthed from their eggshells by her when they hatch. The fry become free-swimming after another seven to nine days.

The parents guard the fry assiduously while they remain in, or in the immediate area of, the breeding cave, but after a couple of weeks, they will start to stray, and the parents make no attempt to keep them in a family party. This is quite common with Tanganyikans — fry are not actively 'herded', although they receive parental protection for as long as they remain 'at home'.

Subsequent spawnings can take place at intervals of as little as four weeks, and it is advisable to remove existing fry before a new brood appears, as otherwise, they may predate upon their younger siblings, even entering the breeding cave to do so (they are small and fast enough to outwit the adults!).

Occasional Problems

All does not always go this smoothly, however. Sometimes, it may take several spawnings before fry are successfully produced, though the aquarist may often be unaware that anything is happening at all until the first fry eventually appear. It is important to be patient and, at all costs, to avoid 'fiddling' with the tank in the hope of producing speedier results. Such interference is more likely to delay the happy day.

Occasionally, a mated pair may quarrel and split up, and this may lead to considerable hostility. The male may drive the female away from the breeding cave, but this should present no problems as long as there is space and cover enough for her to settle elsewhere while she comes back into breeding condition, at which time, the male will almost

inevitably become interested in a reconciliation. In a smallish single species tank (24in — 60cm), it may be necessary to remove one of the warring partners, another plus for the community method.

Rearing the Young

The fry can be fed on the usual small livefoods initially, and these should be directed (e.g. with a pipette) into the immediate vicinity of the breeding cave, to avoid the family scattering away from safety in their attempts to secure a meal. As the parents will be 'tied to the house', it is also sensible to make sure that their food arrives in the correct general area. But try to avoid actually thrusting the pipette into the inner sanctum, as this may put them off entirely.

If at all possible, feed livefoods of a type that will naturally infiltrate the breeding area — e.g. *Daphnia*. Do not worry that food and fry will be confused — I have, after cursing myself for a fool in adding *Daphnia* to a tank containing *N. brichardi* (Lyretail Lamprologus) fry, watched in amazement as the parents carefully selected *Daphnia* from among their brood, and *leleupi* have proved to be just as discriminating.

Slow Growth

The young do not attain adult colour until they are about 1in (2.5cm) long, prior to which they are beige. Like *N. brichardi* juveniles, they have white fin edges, which remain after the body becomes yellow, but disappear before adulthood. Growth is rather slow, and it may take six months for them to attain the yellow colour and reach saleable size. Problems of varied growth rate may be encountered, but these can be remedied by 'batching' the fry according to size to give the smaller ones a chance.

Obvious runts should, of course, be culled, but bear in mind that in many species, one sex (usually the male) is more aggressive and more forward at mealtimes from the start, and that this can lead to a geometric increase in growth rate; while females are inclined to get a slower start. Over-enthusiastic and inconsiderate culling can result in a nice batch of male fishes!

Even if it takes some time to achieve success, time is something you have a fair amount of with this species, as they can easily live to five years old. By this age, an adult pair will be far more obviously sexable, as males will, by then, be much larger than females, with a clearly longer snout and pelvic fins, and even a small hump on the forehead.

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There is a BCA Information Pamphlet on this species, price 50p (cheque/PO) available from BCA (Dept AP), 7 Delamere Avenue, Sale, Cheshire.

Focus on: *Cichlids*

THE HUMPHHEAD LAETACARA

It may, as yet, not have been described scientifically — as a result of which it still awaits a Latin name — but as Norwegian aquarist Alf Stalsberg explains, this beautiful and peaceful small Acara could well become much sought-after by aquarists worldwide.

Photographs by the author



A female (upper fish) with two adult males.

If you're wondering about the name at the top of this article, don't worry, you have probably seen and heard about this fish earlier. In England you have probably heard the name *Aequidens Araguaia*, as Araguaia is one of the collecting sites for this fish. Since the species has not yet been described scientifically, I have to use *Laetacara* sp or the German name for the fish, namely "Buckelkopf" (Hump-head), referring to the fact that old males may develop a steeper forehead. None of my fishes have had this "Buckel" though, and I have had them since 1983.

NAME HISTORY

I would like to use a couple of lines to explain a little bit about the background for a new genus for these small "Aequidens". If you are familiar with the genus *Aequidens*, you will have seen a lot of differences among the various species, indicating that it was time for a change in order to divide the old genus *Aequidens* into several new genera.

Dr Sven Kullander started work on this in his revision of the genus *Cichlasoma* in 1983, where he placed only some of the *Aequidens* as *Aequidens 'sensu stricto'* (in the strict sense of the definition). This group includes species which, in their general appearance, are most similar to *Cichlasoma*. The rest of the "Aequidens" were placed in other groups.

Laetacara, one of the new genera, was created for the small "Aequidens" by Kullander in 1986, and if I mention a couple of old favourites with the new name, you will probably recognise them at once.

How about *Laetacara curviceps* or *Laetacara dorsigera* which was formerly known as *Aequidens curviceps* (the Sheephead Acara or Flag Cichlid) and *A. dorsigera* (the Gold-fin / One-spot / Red-breasted Flag Cichlid)? The name *Laetacara* is put together from the Latin word *laetus*, which means 'happy', and the Guarani Indian name for cichlids, which is *Acara*.

James Langhammer called *Laetacara thayeri* the "Smiling Acara" because it has some dark stripes which run from the mouth

obliquely under the eye, giving the fish a smiling appearance.

Laetacara sp "Buckelkopf" is a very peaceful cichlid which is perfect for a community aquarium. It does not dig, nor does it uproot the plants; it is also very peaceful towards other fish in the tank.

'ELUSIVE' FISH

The only trouble with the fish is getting it. You have to be on a constant look-out in aquarium shops to obtain this species. In the shop it may be a rather dull fish, but if you look at my photos you will probably have a chance to recognise it when you see it in your local aquarium shop or buy it from a friend. You can also see a picture of this fish in *A & P* May 1990 on page 14 taken by our editor John Dawes at an exporter's premises in Rio de Janeiro, Brazil.

I obtained my fish for the first time in 1983 when I went down to Hamburg, Germany, to attend a Cichlid Conference. There I bought six small specimens from my friend Ingo Koslowski.

You might ask yourself where the fish has its true origin, and the easiest answer is Brazil. But if you are like me, you would like to have more specific details about the places where the fish is actually collected.

One of these is the Rio Tocantins near the town of Cametá. It is also found in the Rio Araguaia, but the species is also collected together with *L. curviceps* at several locations along the Rio Amazonas.

SIZE AND APPEARANCE

Adult males grow to about 6cm (c 2.4in) and the females around 4cm (c 1.6in). The species is not too difficult to tell apart from *L. dorsigera* and *L. curviceps*, since the black lateral line on the side of the body can vary a lot and goes down in an arc on the cheek. There are also two thin stripes under the lateral line, which come and go depending on the mood of the fish. Therefore, colour can vary a lot.

Other things that can influence colour are



Although eggs are often laid on flat stones, a broad-leaved plant will do just as well.

A well-matched pair guarding their free-swimming fry.



A nice female in full breeding colours.

low temperature, bullying activities by other fishes, and the lack of hiding places. These, among other things, can make the fish unhappy. I hope some of the photos can give you an idea of what the Humphead Laetacara can look like, even when they are guarding the fry when they turn red on the lower part of the body.

TANK DECORATION

As I mentioned earlier, this lovely fish is absolutely peaceful, so you can use even the most delicate plants to decorate the aquarium with.

Bogwood and stones put together to create caves are good to provide hiding places, while bunches of fine-leaved plants placed in bushes, will make the fish feel comfortable. If there are no hiding places, this species will become very shy, and you won't get a true impression of its many positive qualities.

Place some small flat stones near some of the plant bushes or close to the bogwood and the fish will probably choose to spawn. However, I have also had a pair that spawned on a broad leaf of an Amazon Swordplant.

Other than this, the fish will not demand much.

SPAWNING AND REARING

If specimens are in good condition and the things that matter are right, the Humphead Laetacara will not prove difficult to spawn. The pair usually prefers a smooth flat

stone where they can lay the eggs (after the usual procedure of nipping and cleaning).

The eggs start hatching after a couple of days depending on the temperature — a suitable range is 26-28°C (79-82°F).

After hatching, the fry will be transported to small hollows, and if the fish have not claimed their territory before, they will certainly do it when they have fry to defend. They can even chase much bigger fishes away, but if you have large cichlids in the tank, they will have problems.

'FREE-SWIMMING' PROBLEMS

Problems can also arise when the fry become free-swimming and begin looking for food. Some of the fry always seem to have difficulty taking in even newly-hatched *Artemia* (Brine Shrimp) nauplii (larvae). I therefore give my fry a mix of *Artemia* nauplii, micro-worms and crushed flake food, and this seems to work OK. In any case, they are always picking at the bottom and find something to eat there too.

I feed a little *Artemia* every day, since there can be differences in the growth. By the end of the first week, all the babies will be eating *Artemia* nauplii.

Then the rest is a piece of cake, but don't forget to change water often to maintain a good quality; this will help keep the fry in good health.

Some readers might be lucky owners of this fish already and so will know quite a bit of what I have discussed in this article. To all

the others who, so far, have not had the pleasure of having the Humphead Laetacara, you have something great to look forward to.

This delightful fish is a dwarf cichlid and therefore has a temperament that goes well with other small fishes. You can keep it in an aquarium especially set up for it, or in your show tank in your living room. Either way, if you see some specimens around ... buy them!

My wish is that we will soon be supplied with a proper scientific name for the species so that we can stop calling it *Laetacara* sp "Araguaia" or "Buckelkopf" or Humphead ... or whatever!

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Tomorrow's Aquarist

HINTS TIME

Christmas is coming and it's about time to drop some subtle hints as to what you require. My thoughts are of the 6ft tank I've been promising myself for the last five years.

I'd like to see how Mike (that's the other half) wraps and hides something like that but, as it is highly unlikely that Santa will manage to acquire one for me (last year I got a card that said, "Sorry, tank fell off back of sleigh and broke!"), I guess I'll never know. So, what is left that is in the realms of possibility?

Books are always useful. If you've set your heart on an expensive volume, suggest that three or four people club together and get it for you; a new tank or filtration system could be acquired by the same means.

A subscription to *A&P* would keep a smile on our editor's face! (*How did you know?* Ed)

What about a spare heater/stat, fish food, airline, etc, all the things that are necessary but take up your valuable pocket money?

FINS

Watching a fish, you usually notice how it feeds and how it reacts with other fish, but have you actually watched what it does with its fins? These appendages are just there, after all; they don't really do much... or do they?

There are single fins (dorsal, caudal and anal) and paired fins (pectorals and pelvics or ventrals). Put simply, the caudal (tail) is the prime mover; it gives the fish its initial thrust

forward. The shape of this fin will help you to determine whether the fish is a slow mover, capable of only sudden bursts of speed, in which case the fin will probably be large and truncate (having a straight edge), or deeply forked (lunate). In this case, the fish is a fast-moving creature capable of sustaining long bouts of swimming. Open ocean fishes, such as the tuna, are good examples.

The dorsal (back) and anal (belly) fins, apart from acting as keels to help the fish maintain stability, are also used in locomotion by some species. If you watch any fish with a long-based dorsal and/or anal fin (e.g. the Bow-fin, *Ameioba calva*, with a long-based dorsal fin or, the Electric Eel, *Electrophorus electricus*, which has a long-based anal fin), you will notice wave-like motions passing along the fin which allows the fish to move slowly through the water.

Then there are dorsal fins with hard rays and soft rays, such as those found in the cichlids, and fish with dorsal spines (e.g. catfish) where these can be locked into position, plus all the variations from single spines to double dorsals.

And what of the paired fins? The pelvic (ventral) fins are almost always used as stabilisers and rarely play any part in locomotion, but the pectoral fins do. Flapping movement of these fins allow fine manoeuvring so that the fish looks as though it is just drifting with the current.

This was particularly apparent with some South American Leaf Fish (*Monocirrhus polycaulus*) that I kept. They are hunters par excellence! Gentle fin movements allowed them to

move within centimetres of their unsuspecting prey before they lunged at it. They rarely missed!

With the rays (related to sharks) though, the pectoral fins are not vertical, but horizontal and a wave-like motion is used to propel the fish. In actual fact, these fins are the main propulsion system for rays.

So, during the long winter evenings, take a closer look at your fish to see how their fins are used, and how they may have been modified to suit the particular lifestyle of the fish.

SNAILS

How many times have you had your aquarium overrun with snails? I bet you know the ones I mean — those little brown things with the long conical shell, otherwise known as the Malayan Burrowing Snail. I ask myself, what earthly use are they? The nice little round snails that eat holes in the plants at least have some use — you can feed them to your bigger fish (several of the larger Cichlids will consume them avidly), but they won't touch the Malayan Burrowing Snails. I can only assume that it is because the spiral on the shell is so tight and the shell so solid that they cannot crush the shell to get at the meat.

Removing the small brown snails is simple. A piece of lettuce in the tank in the evening and, by morning, the snails are all over it. Remove the lettuce, plus the snails, and feed to your larger fish.

Now, what about the Malayan Burrowing Snails? These little critters are carnivorous, so lettuce won't do. Tie a small piece of meat (and I emphasise small, as you don't want to pollute your tank) onto a piece of cotton and put this in the tank overnight. By morning, it will be covered with snails and you can lift it out, complete with the snails.

Now you have a problem. What to do with the snails? The only thing that I have found that will eat these beasties is one species of catfish: *Megalodon* *sp.*, and I can only assume that it is eating them because I

put them in the tank. There never seems to be any snails in this tank and the only thing in there that is big enough or even remotely likely to eat them is the *Megalodon*. I know that the Creole name for *M. sp.* is 'Key-way Mamma' which means 'Mother of Snails' and is a reference to its eating habits in the wild.

The other interesting thing that I've found with snails is that they only flourish in my aquaria which have hard water. In the soft-water tanks, the snails perish — even when I introduce healthy Apple Snails, they succumb. Their shells become very thin (almost paper thin) and the snails die. I presume this is because there isn't enough calcium for them to make the shell, or that the acidity of the water is eroding the shell. Can anyone shed any light on this?

NATIONAL SHOWS

There are two national shows coming up in November; BAF (the British Aquarist Festival) on 31 October and 1 November, and The Supreme Festival of Fishkeeping at Weston-super-Mare on 6 and 7 November.

For my sins, I have been asked to give a lecture on 1 November at BAF so, if you want to hear and see (there are audio visual sections) something about Dutch-style furnished aquaria, do see if you can come along.

A colleague of mine, Brian Walsh, is to follow on with a lecture either about breeding or about cats and characins (I can't remember which, but either will be interesting). For those of you in the West Country, Brian will be speaking again at Weston but, although I will be there, I'm not lecturing.

The other good thing about these shows is that you can find out from the national Federations where your local club is. Several people have been in contact about finding a local society and, indeed, some societies have mentioned that they are always looking for new members of any age. One of these was Littlehampton AS so, if you live in that area of Sussex, why not give Brett Paterson a ring on 0903 717599.



MIKE LANGFORD

Deceptive predators: Leaf fish which 'drift' up to their prey.

Focus on: *Cichlids*

HARRY GREEN, OMDA TROPICAL FISH FARMS ASSOCIATION



Prize-winning Festae from Florida's Sanchez Tropical Fish Farm.



Jaw-locking is part of the courtship ritual between a potential pair of Red Festae (the darker fish is the female).

KEEPING AND BREEDING THE RED FESTAE

The Red Festae is big and aggressive. It's also an exemplary parent, as Jeff Challands, editor of *Cichlidae*, the official magazine of the British Cichlid Association, demonstrates.

Photographs — unless otherwise indicated — by Philip Robinson.

This beautiful, large, aggressive species has been known to science since its original description as *Heros festae* by George A. Boulenger in 1899. Like a large number of the cichlids from Central and South America, it has ended up being 'lumped' into the catch-all genus *Cichlasoma*, where it has stayed for many years.

BACKGROUND

Charles Tate Regan, an eminent ichthyologist at the turn of the century, recognised that this situation was untenable and suggested that the genus *Cichlasoma*, as it was understood then, should be broken down into individual sections. As a result, he erected several sections under this genus, in which he placed many of the then known species. In fact, it could be said that Regan is the father of the study of ichthyology as it is understood today, with many of his working methods still being the basis for modern-day ichthyological studies.

Since Regan's original works, there has been very little, if any, serious work carried out on this group of cichlids and, taxonomically speaking, they have ended up in quite a mess. The species *Cichlasoma festae* has been placed in several of Regan's sections, including *Parapetenia*, *Amphilophus* and *Anatheros*, as have many from this group of cichlids.

In more recent years, Sven O. Kullander, a Swedish ichthyologist, has taken on the task of trying to sort out and make sense of the turmoil that has existed for many years concerning all American cichlids, not just *Cichlasoma* species. His work on the genus *Apistogramma* is well known, and he has certainly made sense of a lot of the published material that has appeared over the years on these dwarf cichlids.

His most recent studies have covered species known under the genera *Cichlasoma* and *Aequidens*, and he has adopted Regan's sections for most of the species of the former genus. In fact, he has restricted the genus *Cichlasoma* to around about a dozen species with the rest being listed as "*Cichlasoma*,"

species of uncertain status when compared to the original type species of the genus. It will, no doubt, be many more years before we see the situation clarified with names that are universally accepted. For example, in America, the genus name *Heros* has been considered as more appropriate for many of the formerly known *Cichlasoma* species.

From the aquarist's point of view, the name of a fish is of little importance. As often as not, hobbyists tend to stick to common names, rather than using the currently designated scientific name. If no common name is available, then the specific name will be used. In this case "*C. festae*" currently has two 'common' names, the Red or Green Festae, depending on which colour morph is being considered.

For the sake of this article I will use the scientific name as "*Cichlasoma festae*," or the Red Festae, as is the currently accepted common name of the species in question. Strictly speaking, this species belongs to the sub-genus *Parapetenia*.

AVAILABILITY

Sadly, the cichlids of America have been badly neglected by aquarists in favour of those from the African continent. While dwarf species of American cichlids have retained some popularity, the larger species have been pushed out of contention and their availability on a large scale has greatly decreased. Some of the smaller species, like the good old Convict Cichlid, have managed to survive, but these have often been badly treated because of the lack of any new, wild specimens being made available. As a result, the breeding stock has been greatly depleted.

Thankfully, over the past year or two, a lot of the larger American cichlids are now becoming more widely available. I think that, to a large degree, this is because:

- in some areas, African cichlids are going out of fashion;
- there are a small number of dedicated cichlid keepers who now favour American species and have helped to create a demand for them;



The breeding colours of this female fanning her eggs are beautifully intense.



Surrounded by her two-week-old fry, a Red Festae female poses a considerable deterrent to any potential predators.

(c) there are one or two importers and wholesalers who have been prepared to bring wild or near-wild specimens into the country.

This, in itself, should mean that good breeding stock will become available and, with careful and selective breeding by those of us more interested in the fish than the money they could possibly bring, should ensure that good specimens will be around for a long time to come.

The pair in this article were purchased as sub-adults, with the male being about 5in (c 13cm) in total length and the female 4in (10cm). We originally saw them in a dealer's tank, along with specimens of the Green Festae, and they were just beginning to show their adult coloration. Even at this size, they looked magnificent, and if the colour was any indication to go by, they were going to be very beautiful fish indeed. We were not going to be disappointed, as can be seen from the photographs.

In nature, this species is reputed to attain a maximum size of 18+ in (45+ cm); in the aquarium, half of this would be more to the true size that this fish will be seen at. Breeding size should be about 6in (15cm) for the male and 5in (c 13cm) for the female.

Allowing fish to breed while they are still too small will, eventually, end up with it being dwarfed as its energies, at least those of the female, would be put into egg production instead of growing. It is therefore wise to rear these, or any potentially large cichlids, apart until the desired size is attained. At least, that is the method that I often follow if I do not want to end up with small specimens.

MAINTENANCE

As this fish was new, experience had to be gained with regard to its care and maintenance. Its behavioural activities were not known either, and, apart from what could be gleaned from books and magazine articles, it was a case of spending many hours watching their behaviour, especially with regard to the male towards his potential mate. It is a well known fact that, with American cichlids, the male will, in the severest cases, end up killing his often-much-smaller mate, especially if he wants to breed and she is not yet ready. All too often, it is at this stage where a potential pair ends up as an individual.

Once they had been introduced to their new water conditions and quarantined until they had become acclimatised to their new surroundings, it was decided that the best possible results could be attained initially if our pair were part of a cichlid community tank. They were eating and growing well,

and it was obvious from their behaviour that they would not be long before coming into breeding conditions. At that time, the problems could really begin, if due care and attention were not paid.

The Tank

The largest tank available at the time, was 54 x 18 x 18in (137 x 45 x 45cm) with a 55-gallon (c 210-litre) capacity after allowing for water displacement because of the tank's substrate. Filtration was by undergravel filters driven by power heads. Water temperature was 28°C (82°F), with the decor consisting of, apart from the gravel substrate, smooth rounded stones forming caves, plus a few plastic plants, as real ones in this sort of situation would not last very long.

The choice of occupants for this community tank was going to pose a problem, and it was decided to try the following mixture: Four Pygmy Green-eyed Cichlids (*Neotrophus nematopus*) of 2-3in (5-7.5cm) in length, which tend to stick to the lower parts of the tank. Then came a 6in (15cm) wild male Red Devil (*Cichlasoma labianum*) that had recently been purchased. Finally, apart from the "C." festae an 8in (20cm) male Blue-eyed Cichlid (*Cichlasoma synspilus*) was chosen. Not the best possible mixture, but we had to begin somewhere.

GENERAL BEHAVIOUR

Initially, there was a lot of aggression between the two larger fish, but not to the point of any permanent damage being done to either individual. As is the case with a tank of mixed cichlids, a pecking order was soon formed, with the dominant fish being the "C." synspilus, followed by the "C." labianum. With the latter fish being a wild specimen, it probably still had most of its very aggressive nature.

The pair of Red Festae were generally given low status in the pecking order of things and were not unduly bullied. As long as they stayed within their own boundaries of the tank, namely one corner, and did not challenge their larger counterparts, they were left alone.

The *Neotrophus* had a world of their own. Since they caused more problems between themselves trying to decide who would be the boss of the group than pay any attention to the larger fish, they were, for the most part, ignored. Because of their smaller size, they posed no real threat anyway to the other occupants, although these fish are quite capable of taking care of themselves when they decide that they want to breed, but that is another story.

BREEDING BEHAVIOUR

It was not long before it was very obvious that the pair of Red Festae wanted to spawn. The intensity in their coloration increased dramatically, and courtship displays became very intense, especially by the male. The female's breeding tube then appeared and the pair defended their chosen corner of the tank vigorously, taking it in turns to clean their chosen spawning site, a smooth rock.

Two days after the appearance of the female's breeding tube, spawning took place. During the spawning act, the Red Devil approached the pair on a few occasions, but he was repulsed, first by the male who was nearer to his size, and then by the pair.

The large Blue-eyed Cichlid became very curious as to what all of the activity was in the corner, and came over to investigate. At the sight of him, both of the Festae stopped laying eggs and took up a defensive pose to try to ward off the attention now being paid to their eggs. Because of the Blue-eyed Cichlid being notably larger than the two Festae, plus the added onslaught of the Red Devil, it soon became very obvious that the Festae were unable to care for their eggs with safety, and so the two larger fish had to be removed to other quarters.

Once this threat had been removed, it was not long before spawning resumed; it took two hours from beginning to end for the act to be completed.

Egg Care

Once the egg laying was all over and done with, the female spent most of her time caring for the clutch for the next five to six days. She would constantly hover over the spawning site, fanning the eggs and removing any that had not been fertilised and had fungussed over. The male took up the defensive role of patrolling the boundaries of his chosen territory, chasing away any of the Pygmy Green-eyes that dared to venture too close to the brood. The colour intensity of both fish had to be seen to be believed, with the female possibly being the brighter of the pair.

Fry Care

When the eggs began to hatch out, the female appeared to assist the emerging fry by breaking the shells of the eggs and picking up the young, only to deposit them into a pit that was close by and had been dug ready for the fry's hatching out. This process was completed six days after spawning.

It took a further six days before the fry were free-swimming and, once the batch were all mobile, they were herded into a tight group. It was at this stage that they were fed on newly-hatched brine shrimp; this went on for the first two weeks of their young lives.

As the fry became larger, and more adventurous, it became more and more difficult for the parents to contain them within the confines of the breeding territory and, as each day passed, the fry would begin to explore further and further away from their home territory. As part of their natural care

instinct, initially, the parents (usually the female), would collect any wandering fry into their mouths and spit them back into the main bunch.

Expanded Territory

As the fry became more and more difficult to control in this small environment, the parents enlarged their territory to the point of taking over the whole of the tank.

It began with the male in the lead, patrolling his ever-larger boundaries, with the young following behind and exploring everywhere as they went, in their search for anything that was edible. In the rear came the female who would be dashing from side to side, seemingly checking on any of her brood that wandered from the main bunch.

Occasionally, both parents would swap positions until the whole of the tank had been claimed as their territory. Woe betide any of the *Neotrophus* that dared to venture out from their caves. They were very quickly chased back by the Red Festae who, because of their much larger size and bright coloration, must have appeared a rather daunting prospect to any of the fish feeling brave enough to risk their wrath.

Like the young of most fish, Red Festae fry grow very quickly in the first weeks of their young lives. They are also larger than those of closely related cichlids when they first emerge from their eggs, often by as much as double normal size. At three weeks, they were 1cm (0.4in) in length and, at five

weeks they had, on average, reached 1.5cm (0.6in). By this time, their characteristic bar pattern was well established and clearly visible.

As it became more and more difficult for the parents to care for their wandering brood, which were gradually being eaten by the *Neotrophus*, the fry were siphoned out of the main tank and into a tank for growing on. They were fed on a variety of foods to enhance their growth rate quickly. There was soon a very noticeable difference in the speed at which some of these young were attaining their size. The larger fry would be the ones to select first for further breeding in years to come.

Once the young had been removed from the main tank, the wild male Red Devil was re-introduced. It was not long before it established itself as the dominant fish once more, and the Red Festae were, again, relegated to about one-third of the tank as their home territory.

CONCLUSION

The Red Festae is one of the most colourful of the larger American cichlids, especially when in breeding dress, but it is definitely not a fish for the novice aquarist. While a breeding pair may look wonderful in a large tank in the shop, they hide a very nasty side, as do many large cichlids.

Obtaining a compatible and proven pair is very rare indeed, and the best way to begin with this, or any other species of American

cichlid, regardless of size, is to purchase a group of, at least, half a dozen specimens of 1in (2.5cm) or so in length. At this size, they can either be kept in a tank on their own, or added to a community tank of other cichlids and/or potentially large fish such as gouramis.

As they grow and their behaviour to each other changes, any fish that are harassed should be removed, as should any that cannot hold their own against the most dominant specimens. It is not advisable to remove what may appear to be a pair from the group, unless, of course, two of the fish take over one corner of the tank in an obvious manner that indicates they want to breed. Should the most dominant two of the group be removed, then the most dominant fish out of this pair will pick on its tankmate.

Even when a pair has emerged, they should not be kept on their own, apart from when they are breeding, for it is in their nature that the male will torment the female and hound her to the point of death if he wants to breed and she does not. Trying to establish a potential breeding pair as part of a cichlid community, as described in this article, will — in my opinion — achieve the best result.

For full details of the British Cichlid Association, contact Howard Barnfather, Membership Secretary, 100 Keighley Road, Skipton, North Yorkshire BD23 2RA. Tel: 0756 794980.

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Koi Calendar

By David Twigg

JOBS FOR THE MONTH

Winter is definitely with us in November. At time of writing, however, I think that winter has arrived two months early! On the assumption that you have winter covers in place don't, please, let your Koi be 'out of sight out of mind'.

It may be that they are still feeding. If so cleaning of the pond is still necessary. If possible, arrange covers so that minimum disturbance is caused when keeping an eye on the fish and 'vacc'ing off'.

If feeding has been stopped and we do have the occasional sunny day, it may be that the fish will be looking for food. Please bear in mind that the metabolism of Koi slows right down with decreasing water temperature and, therefore, the fish cannot process the food they consume as easily, or indeed as quickly, as when water temperature is considerably warmer.

If you have no heat, I would suggest you give thought to the weather forecast for the following couple of days before being tempted to feed. If a colder spell is predicted, then maybe it would be wise to err on the side of caution and resist the temptation to feed.

My own view is that your Koi will welcome your daily attention even when feeding has ceased and, given that you do not completely shut them off from the outside world, will not be stressed by your attention.

ANOTHER NEW KOI CLUB

This hobby of ours is really taking off! Or are we just bringing into the open the many Koi keepers around the country who have been beavering away for years at their water quality and keeping their Koi in good health without knowing of the existence of the BKKS or any of the independent Koi clubs around the country?

Whatever the answer, it has got to be good for the hobby. Clubs of any description are there for the benefit of the

members and, in this case, the Koi. Information is gleaned, knowledge improved by exchange of ideas, and quality of life for our fish is vastly enriched. That can't be bad, can it?

Back to the new club. The **Border Koi Club**, based upon Carlisle, serves that area and the area 'over the border' into Scotland. Local advertising is, I am told, bringing enquiries almost daily. The club had its first meeting in July and secretary **Mrs Amy Fischer** tells me that they have already outgrown their meeting place and a new venue will be required shortly. Amy also said that an application had been made to the BKKS for 'Section' status.

For more information on the **Border Koi Club** contact **Amy** on 0228 523623.

NOVEMBER SHOW

14 November sees the **Northern Section BKKS Winter Open Show** at Laporte Social Club, Cromwell Avenue, Great Sankey, Warrington. This indoor show will be the first-ever winter show held in the UK.

It is to be an English-style show in which each exhibitor will have his/her own vat. At the time of writing, 28 vats are already booked. I am told there are plenty of parking spaces available for visitors to the show.

There will be at least six Koi dealers present, and a small Craft Fair with 12-15 stalls to add family interest to the occasion. For further details, contact **Tony McCann** on 061 794 1958 or **Derek York** on 0925 724 680.

WHAT'S ON IN NOVEMBER

- 2 - **Kenet Valley Section BKKS**. 8 pm at Newbury Rugby Club, Pinchington Lane, Newbury, Berks. Contact **Bob Thompson** on 0734 713640.
- East Riding Section BKKS**. Monthly meeting in Beverley. Contact **Rod Young** on 0482 866770 for further details of venue.
- 3 - **Yorkshire Section BKKS**. 8 pm, The Holy Trinity

NOVEMBER

S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Church Hall, Ossett, Nr Wakefield. Contact **Fred Harston** on 0226 722578.

4 - **Suffolk & North Essex Section BKKS**. 7.45 pm at the Prince of Wales PH, London Road, Marks Tey, Colchester, Essex. Contact **Dennis Preon** on 0371 856450.

5 - **Middlesex & Surrey Borders Section BKKS**. Hampton Football Club. Contact **Joy Fraser** on 0737 844338.

Merseyside Section BKKS. Bonfire night. Contact **Phil Adamson** on 051 220 2970.

North Wales Koi Club. Koi Quiz. 7.45 pm, David Bryant Bowling Centre, Frith Beach, Prestatyn. Contact **Eileen Price** on 0745 591730.

8 - **Mid-Somerset Section BKKS**. West Monkton Village Hall at 2 pm. Competition time - *Know your Koi*. Contact **Alan Purnell** on 0458 72132.

Central Section BKKS. TP Riley Community Centre, Bloxwich. Monthly meeting. Contact **Martin Lefevre** on 078571 5242.

9 - **Northants Section BKKS**. Koi photo competition. Casuals Rugby Club, Northampton. Contact **John Byles** on 0604 718648.

10 - **Chiltern Section BKKS**. Contact **Ann Howard** on 0462 679315 or **Mike Reed** on 0525 375418.

11 - **South Hants Section BKKS**. Speaker is **Dr Andrew Worthington**. 8 pm, Denmead Church Hall, Hambledon Road, Denmead, Hants. Contact **George Rooney** on 0420 473169.

Merseyside Section BKKS. Speaker is **Geoff Lambert** of Pro-Koi. Millbrook Manor Restau-

rant, Knowsley Village. Contact **Phil Adamson** on 051 220 2970.

14 - **Heart of England Koi Society**. Warwick. Koi Quiz. Contact me on 0926 495213.

15 - **Scottish Section BKKS**. Meeting in Kilmacollm. Contact **Ian Boyd** on 0505 872696.

18 - **Mid-Staffs Section BKKS**. RNA Club, Elmore Green Road, Bloxwich. 8 pm. Contact **Don Dyche** on 0543 425178.

19 - **Wirral & District Section BKKS**. Lever Sports & Social Club at 8 pm. Contact **Jean Moffat** on 051 678 1769.

21 - **Northern Section BKKS**. 20th Anniversary Dinner Dance. Book with **Liz Donlan** on 061 643 9107.

22 - **South East of England Section BKKS**. Chelmsfield, Kent. Contact **Mick Wright** on 0634 718943.

Essex Section BKKS. Speaker is **Bernice Brewster**. North Stifford Village Hall. Contact **Bobbie Barton** on 0702 611750 or **Margaret Bishop** on 0702 522388.

25 - **London Section BKKS**. Ruskin House, Coombe Road, Croydon, starting 8 pm. *Social Evening*. Contact **Keith Nind** on 081 673 3574.

27 - **South East of England Section BKKS**. Chelmsfield, Kent. Contact **Mick Wright** on 0634 718943.

NEXT MONTH

FULL DETAILS OF THE WINNERS OF OUR STUART TURNER PHOTOGRAPHIC COMPETITION

Patently speaking

By Anthony Edwards



In this month's selection of patents, a number of long-standing problems with aquaria are claimed to be minimised or overcome.

A method of injecting gas into liquid designed for use in aerating a fish tank is claimed to give an extra-large number of small air bubbles (Patent No. 2233245).

Ozone generators are widely used in tanks to make the water crystal-clear, but can be costly to run. Patent No. 2237961 describes a generator that uses only 1 watt of electricity and is therefore very economical.

The transportation of live fish can be fraught with many problems. Patent No. 2245809 describes an ingenious method of reducing the build-up of the concentration of ammonium by the use of a substance contained in a tea-bag-like structure. I became acquainted with this problem at an early age during the second world war when, as a small boy, I wondered why a jam jar of sticklebacks caught in a London pond and transported on a coach to Somerset were dead on arrival.

A number of problems also arise in the use of power heads. One is often in the shape of the housing. Typically, the housing is constructed with flat side-walls, and, frequently, a wedge-shaped space develops between the walls of the housing and the tank. A fish may swim into the space between the housing and a tank wall and become trapped and suffocated by the narrowing wedge-shaped space.

The power head described in Patent No. 2245934 is contained in a housing having a circular cylindrical sidewall

which avoids entrapment of a fish between the housing and the tank wall.

A conventional water-freshening board spread on the bottom of an aquarium is often a simple corrugated panel which does not match the size and figure of the unit. Filters spread on such boards can fall down into the limited space under the corrugated panel through the gaps formed between it (the panel) and the walls of the aquarium itself.

The invention described in Patent No. 2242340 concerns a knockdown water-freshening board consisting, mainly, of a number of square panel units, side shields, and pipe-receiving members. Each of the square panel units is provided with a number of downward projecting round legs and round hollow bars. By inserting the round legs of one square panel unit into the round hollow bars of another square panel unit, two square panel units may join each other. In this way, the inner space of an aquarium may be adequately separated into an upper and lower part. Filters placed on the water-freshening board may therefore be effectively prevented from falling down into the lower space formed below the board.

PATENT ABSTRACTS Injecting Gas Into Liquid

In UK Patent 2233245, Lian Seng Lee and Kim Teck Tew describe a device for injecting gas into a liquid in a fish tank.

It comprises a tube (2) through which the liquid can flow, and has, at or near one end, one or more tubes (4) through which the gas can flow. Flow of liquid through the tube causes gas to be drawn through the tube or tubes for the gas to mix with the liquid to form a gas-liquid mixture.

The device further comprises a means whereby further gas can be drawn through holes (10) into the gas-liquid mixture leaving the end of the tube. The combination of the first stage and second stage mixing produces a final air-water mixture that contains many small air bubbles, whereby a large amount of air will be dissolved.

An Ozone Generator for Aquaria

In UK Patent 2237961, Keith Raymond Dalton and Roger John Cheeseman describe an ozone generator for a fish tank.

Ozone generators for aquaria are not always satisfactory in that they are bulky and not especially economical to run. The present invention is claimed to provide an ozone generator which is both small and economical. It will operate on 1 watt. It comprises a gas-filled discharge device (e.g. filled with neon) forming a dielectric.

An anode is positioned around the outside of the discharge device with a capacitor discharge for feeding a needle-pulsed voltage to the anode. There is a means for connecting the ozone generator in an airline of the fish tank.

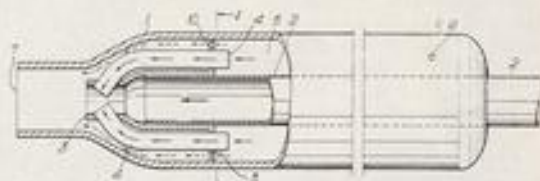
In use, air in the airline

enters the ozone generator and, when a high voltage is applied to the anode, ozone is generated at the cathode to produce a mixture of air and ozone for the fish tank.

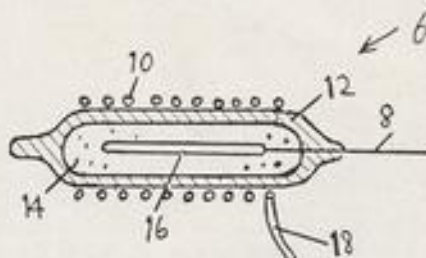
Method for Transporting Live Fish

In UK Patent 2245809, CSIR describe a method of transporting live fish immersed in fresh-water under oxygen in a vessel such as a plastic bag.

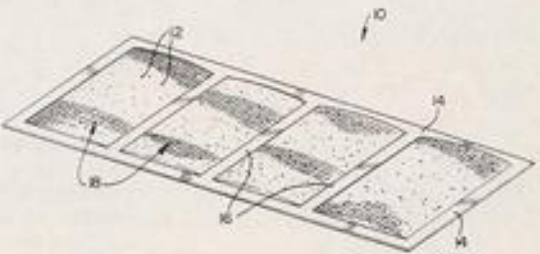
The rate of build-up of NH_4^+ ions (ammonium) in the water in the vessel while the fish are present, is reduced by sorbing NH_4^+ ions by means of clinoptilolite (a clay-type zeolite mineral, which has the ability to remove NH_4^+ ions from water by ion exchange with sodium ions at active sites).



Gas-injecting Device (Patent No. 2233245) [*see footnote].



Ozone Generator (Patent No. 2237961).



Clinoptilolite 'Tea Bags' (Patent No. 2245809).

The clinoptilolite is contained in a bag, such as a tea bag, with porous walls. The invention also provides a device comprising a tea bag (10) containing particulate clinoptilolite (17).

Aquarium Power Head

In UK Patent 2245934, **Willinger Bros Inc** describe a water pump assembly for an aquarium aeration system.

It includes a housing surrounding an electric pump. Within the housing, a water conduit passes an impeller of the pump to generate a stream of moving water. An air-breather conduit conducts air from above the housing to an air-induction port in a sidewall of the water conduit. The moving water produces a venturi action for drawing in air and entraining it as a series of bubbles in the stream of water, producing sound.

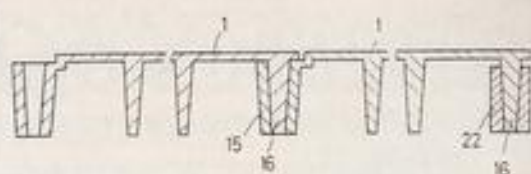
A silencer fitted on top of the housing is connected serially with the air-breather conduit for attenuating the sound to permit viewing the aquarium without the distraction of the

sound. A valve (112) may be located on an air inlet port above the silencer for adjusting the rate of flow of the air.

The silencer incorporates a serpentine corridor (200) for conduction of the air, the corri-



Power Head (Patent No. 2245934).



'Water-freshening' Board (Patent No. 2242340).

dor comprising a set of baffles. This set of arcuate passages is of sufficiently small cross-sectional dimensions for attenuating the sound. Advantages claimed are that it is not necessary to use absorbent cotton or polyester to absorb sound.

Water-Freshening Board for Aquaria

In UK Patent 2242340, **Wen-Yau Shieh** describes a knock-down water-freshening board.

It is assembled by joining a number of square, triangular, or rectangular panel units (1) by engaging legs (16) in hollow pegs (15, 22) of adjoining units or edge members, whereby the shape/size may be varied according to need. Round openings and pipe-receiving members pre-formed on the

square panel units provide a means of holding pipelines of a water circulating system.

In this way, the space available within an aquarium may be separated into an upper and a lower part, and filters placed on the water-freshening board are prevented from falling down into the space created below.

* FOOTNOTE

The illustrations published in **Patently Speaking** are duplicated from the original Patent diagrams submitted with the Patent Applications.

Therefore, unless otherwise indicated in the text, the numbers which appear in the figures are those that accompany the original Patent submissions.

M J QUINLAN
South Wales,
CF48 4BZ.

Dear Sir or Madam,

I've just recently set up a tropical aquarium and, having introduced fish from several different shops, I've acquired a terrible outbreak of whitespot. I've spent a considerable amount of money on cures but none were effective until I was recommended to use WATERLIFE 'PROTOZIN' which I am very pleased to say has done the trick perfectly. Thank you for a wonderful product.

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AQUATICS

Yours sincerely,
M J QUINLAN (Mr).

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Naturalist's notebook

By Eric Hardy

DESERT TORTOISE v CATTLE

Earlier this year, the US Bureau of Land Management mandated the removal of cattle from March to mid-June on Nevada ranches because they were grazing grasses in competition with the endangered Desert Tortoise. It was obliged to under the Endangered Species Act. Angry ranchers opposed it because of their feed costs. A 220-acre research centre was then set up to study it, and a 400,000-acre tortoise reserve was established at Clark County, Las Vegas.

Cattle are also believed to impact the burrows of tortoises which sleep underground some eight months each year. These tortoise populations declined 90% in the last half-century; faster in parts of the Mojave. Once they were 1,000 to the square mile, and now only 60,000 are estimated to remain in the area.

Another theory puts their dramatic decline to a respiratory epidemic contracted from liberated pets.

CHESHIRE DRAGONFLIES

The enigma of the Golden-ringed Dragonfly faces Cheshire recorders because, although it occurs in surrounding south Lancashire, Derbyshire and Clywd and everyone thinks it should be there, no definite record has been made. So it's not included in the new, 62-page paperback *Dragonflies and Damselflies of Cheshire* by Richard Gabb and David Kitching, published recently by the National Museums on Merseyside, Liverpool, at £8.95.

Illustrated with distribution maps, monochrome and colour photos, it's not just a list of the 25 species mapped in recent years, 19 of which breed. It describes habits and habitats and, in particular, their major haunts like Hatchmere, with 14 species including the Hairy Dragonfly, Risley Moss with 14, Abbots Moss (Delamere), Churton Marl Pits near Chester, with 12 species and the Weaver at Vale Royal.

Cheshire's variety of wetlands and numerous meres con-

tributes to the richness of its dragonfly fauna, almost three-quarters of the British list; but drainage has destroyed many haunts in recent years. As well as Behington, the book's Wirral site for the uncommon Broad-bodied Chaser, a friend sent me his photo of one at Raby Farm in 1978, and another recent site is at Long Lane, Houghton, south Cheshire.

The earliest species abroad in Cheshire in spring is usually the large Red Damsel at Petty Pool, Delamere; the latest, in late autumn, is the Red-veined Darter, while the most widespread is the Blue-tailed Damsel in a variety of colour.

I was recently on Whixall Moss, a national nature reserve in north Shropshire, near Whitchurch, with the scarce White-faced Dragonfly. I saw plenty of Marsh Andromeda in flower but failed to find any Bladderwort in its drying pools and dykes.

MIXED BAG

We all know how frogs return to spawn in the same ponds each spring. How they sense their direction, detecting humidity and so on, is another matter. Two biologists at Towson State University, USA, have found the Dart Poison Frog, *Dendrobates*, uses airborne smell as a clue.

Zoologists at Arizona State University found that male Tree Lizards use their throat colour to signal their status in domination.

Other interests include a double-headed Sand Boa in

India, 'growling' in the King Cobra, and the exceptionally long venom glands in Night Adders extending well into the neck, while those of Coral Snakes, *Manicora*, extend back along the trunk, up to a quarter of the total body length!

A recent questioning of 1,000 people by a leading garden seeds firm found 21 would like to have a garden pool, apart from swimming pools, but none had one. Small samples like this make opinion polls misleading and builders rarely include a garden pool in their advertised designs.

From the new hide built recently in Coed y Fron Wilt forest reserve above Nant Melin Dwr, behind Bontuchel, near Ruthin, North Wales, I gazed down into a green and sunlit valley packed with trees in their leafy struggle to reach the light. The Grey Wagtail's stream below, a tributary of the Clywydog, had been dammed with sandbags to form a pool to lure the local otters. It was a struggle up the angled river-bank, to ford the stream and battle through thousands of thorns to lunch beneath the larch trees, but this river valley has been made into an excellent forestry reserve, with nesting Pied Flycatchers and Redstarts and four sorts of Fritillary Butterflies.

Without feeder-streams from the sphagnum-pools on Salop's Whixall Moss to the Natterjack pools on Formby-Ainsdale dunes of south Lancashire, a crisis threatens their aquatic plants and insects after recent dry, hot summers. Southport dunes will lose their Grass of

Parnassus, Wintergreen, Bog Pimpernel and Marsh Orchids if it goes on for any more years, though the White-faced Dragonfly was still flying this summer at Delamere's Black Lake in Cheshire.

Formby-Freshfield Natterjacks moved to three unexpected new pools, but most of their smaller pools dried out before their tadpoles hatched. The subterranean water-table there has been going down for years and many old pools, like the largest, Massam's Slack, dried out permanently.

LOCH NESS SURVEY

The press would probably not have carried the story of the July survey of Loch Ness freshwater biology by Freshwater Biological Association and other biologists, had it been at Loch Lomond or some other water. Although the expedition made no direct mention of the so-called monster, a statement that it was "highly likely that species new to science will be discovered in Loch Ness" was quoted as if it meant this fictitious beast, rather than microscopic invertebrates.

The press still assumes that all the many 'sightings' reported in the past are of the same thing, when they are all the various misreadings and misidentifications of ordinary aquatic objects by people without elementary knowledge of what they saw.

I wrote one of the first press stories of this myth in the Dundee Courier some 60 years ago, quoting Prof Ritchie of Aberdeen as stating that something, as yet unidentified, seemed to have caused the interest. That did not mean that a proper view of adequate details could not have named it.

It is well proven that if one publishes a rumour about some rare sighting, there will always be readers claiming to confirm it. It's the difference between scientific evidence, or proof, that others can confirm, and popular assumption.



Natterjack Toad — over-dry summers threaten its habitat.

COMING NEXT MONTH
MARINE SUPPLEMENT
DON'T MISS IT!

News from the societies

Hounslow and District Society

The Annual Open Show held at The Youth Centre, Kingsley Road, Hounslow, on Saturday, 12 Sept was attended by members of aquarist societies from Kent, Southampton, Portsmouth, Salisbury, Southend, Corby, Port Talbot and Cardiff, and was well supported by other societies in the Home Counties. There was a total of 324 entries in the tropical fish classes, 48 in the coldwater section, 8 furnished aquaria and 6 aquascapes.

The silver cups, trophies and plaques for the 38 classes made a very impressive display; other prizes and card awards to fourth place were available for the other lucky winners.

The Best Fish In Show award went to Bob Lemon of

Kent for a superb *Gymnocorymbus ternetzi*.

The F.B.A.S. Championship Trophy was awarded to an outstanding catfish owned by Mrs Pat Edwards of Kent, who competed against 41 other entries in that class.

The International Siamese Fighter Championship trophy was presented to R Chapman of Southampton, as overall winner of the Fighter classes. The show was run according to F.B.A.S. rules, and the following judges presided: R Esson, J Pannell, J Stillwell, G Woolley, C Pannell, D McAllister, C Cheswright, I Goddard.

Visitors are welcome to the Hounslow society meetings which are held on alternate Wednesdays at St Stephens Church Hall, Parkside Road, Hounslow. Dates for the remainder of 1992 are: 4 and 18 Nov, and 2 and 16 Dec.



"Now that's strange, I can't see the Stone Loach anywhere Dad!"

Information regarding the society's activities can be obtained from the Hon Secre-

tary, R Nelhams, 35 Exeфорde Avenue, Ashford, Middlesex. Tel: 0784 259880.

Diary dates

Sunday 15 November

Bishop Auckland and Wear Valley A.S.: A National Aquatic Auction — the first of its kind — will be held, with all proceeds being donated to the BBC Children In Need Appeal.

All the proceeds, whether from sales or advertising . . . or any other source, will go directly to the fund. Full details from John Corrigan, Charity Auction Secretary, 8 Clifton Green, Sunnyside, Crook, Co. Durham, DL15 0NP. Tel: 0388 745674.

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What's your opinion?

By Billy Whiteside,
BA, ACP

IN SYMPATHY

In a recent issue, mention was made of Ron Wright, past secretary of the Anabantoid Association of Great Britain, who had moved to the other side of the world.

David Armitage, who is editor of *Labyrinth* — the AAGB's magazine — has just passed on the sad news that Ron's wife, Rene, had passed away in her sleep after a particularly nasty strain of flu. I'm sure readers will join us, at *A & P*, and the AAGB, in sending sincerest sympathy to Ron.

RED DWARFS

Labyrinth Number 64 contains several interesting articles. I'm very fond of a number of varieties of Gouramis and I especially enjoyed the article on *Coina lala*, the Dwarf Gourami, by Stephen Clark (occasional contributor to *A & P*). I first bred the Dwarf Gourami many years ago and it has been a favourite ever since.

A few months ago, I bought a pair of Dwarf Gouramis. The female is perfectly plain, as the photograph shows, but the male is a most delightful red with almost-fluorescent blue highlights.

My two fish seem to bother very little with each other, so there is little prospect of their spawning in the near future. If you have not tried the Dwarf Gourami, I suggest you spend a couple of pounds on a pair. They are peaceful and not too difficult to get to breed.

FRUSTRATED FROM WICKLOW

It's been some years since anyone has written from the South of Ireland, so I was pleased to receive a letter from Anthony Lawes, of 110 Mount Carmel Avenue, Wicklow Town, Co Wicklow, Eire.

Anthony began: "I write from distant lands as an extremely frustrated fishkeeper! I shall explain. ... As a fishkeeper in my native county of Essex, I had an abundance of really excellent aquatic outlets in the area, which I could visit to admire the varieties just in — as well as seeing all the com-

monly-kept community fish. This meant I had an ever-growing tank/fish collection which I could cater for with ease.

"Fate then beheld me, and the love of an Irish girl lured me to the Emerald Isle. Dismantling and removing several tanks and moving numerous fish were beyond the realms of practicality to transport to Ireland, so I arrived tankless and fishless, immediately intending to start from scratch.

"Herein lies the frustration. There exists a distinct lack of decent aquatic outlets. Do you know of any mail order advertisers who mail order fish? I'm even prepared to travel to the North of Ireland in order to see a really decent shop and make purchases. Live food or cultures to prepare them, as well as plants, seem to be extinct.

"I remember reading in an edition of *A & P* a fascinating article about a visit to the Amazon by Irish aquarists Martin and Mary Roche — obviously keen aquarists who take their fish seriously. I would be interested and intrigued to learn how, or if, they obtain quality fish. My collection is just one 36in (90cm) tank housing only Firemouths. I have obtained several 36in tanks and it just grieves me to see them lying empty and not full of interesting fish."

I'm happy to say I can help Anthony. There are numbers of good aquarium shops and large pet supermarkets, as well as quite a few small pet shops, which stock tropical and cold-water fish. Garden centres sometimes also stock coldwater fish of reasonable quality.

The shop I like best — Grosvenor Tropicals, 160 Bearsbridge Road — is in Belfast and it can certainly hold its own with good shops in England and the USA. It's quite close to Belfast's Central Station, so perhaps Anthony could arrange something by train, e.g. a trip to Belfast.

I visited my Belfast dealer since I wrote the above and asked him about his trips up the Amazon. Alf Robbins told me that, about the most amusing thing he had seen up the Amazon, was our editor, John Dawes, standing in a tropical

rainstorm with his wellington boots, his umbrella, camera and 'Pacomac', as the rain lashed down on everyone. I shall probably get the sack for repeating that amusing story! [Well, now that Alf has given away my innermost secret, I suppose I'll have to live with it for the rest of my life! Ed.]

RATIONALISED SYSTEMS

Alan O'Brien resides at 86 Blumfield Crescent, Slough, Berks, and he writes: "I have been busy rationalising my systems, as the amount of time I spent maintaining my tanks was becoming prohibitive. I now have only two systems in the house; one 50-gallon (190-litre) tropical freshwater, and one 60-gallon (c 230-litre) tropical marine, both cabinet-based and designed and built by myself.

"I am pleased to report that the plants you sent me are doing very well in the former — possibly due to the undergravel heating I installed?

"On the subject of filters: I think air-operated filters have their place, but I would not like to rely solely on one. In undergravel filters, for instance, you would need a large air pump to get a reasonable water turn-over rate and, for the same or lower cost, a power head would do a better job.

"Having said that, I always make use of air in the aquarium for the sake of both the fish and the aesthetics. I believe that to use only an air-stone is rather a

waste, so I always place a small box filter filled with Siporax or the like in a corner. This makes the air both aesthetically pleasing and useful for a small amount of biological filtration.

"Regarding heater/stats, I have always thought them reliable and good value until recently. I found that, with my marine system, due to the fact that I use five tubes, I was getting a 4°C (c 7°F) temperature variation over 24 hours. Presumably, the tubes were heating the water and the heater/stats were sticking slightly. This was solved after much sticking of fingers into the tank, making minute adjustments over considerable time. Next time, or when I have to replace them, I will go for separate heaters and stats.

Copper-based problems

"Regarding the previous issues of problems with algal remedies, I am sorry to report that I have had a similar experience with a fish medication that I recently used to expel a small amount of White Spot from my marine system. The particular marine cure is a copper-based medication.

"I used it exactly as per the instructions, and checked the concentration with a test kit. Within 24 hours, I had lost two valuable Tangs, including my favourite that I had kept for two years. At this stage, I put carbon and a polyfilter into the system in an attempt to remove the medication.



My newly-acquired Red Dwarf Gourami female is very plain-coloured.



The male, in contrast, is a most colourful, attractive fish.

"The following 24 hours saw the death of another fish — this time a Butterfly. These losses, remember, happened using a medication exactly as stated in the instructions. All other readings — nitrite, pH, temperature, nitrate, etc — were normal.

"The medication was monitored and was supposed to be at the so-called 'safe', short-term exposure level of 0.25 mg/l. As all other readings were normal and nothing could have leached into the tank — or indeed was added to the tank, except the medication — I can only conclude that it was responsible for the deaths.

"This caused me to talk to some of the local suppliers about medication for marines, and copper-based medications specifically. Two of the 'better' local suppliers stated that they would not use copper-based medications. This astonished me, since one of them sold me the offending product.

"Incidentally, I spoke to the manufacturers and they could not explain the deaths. So, once again I find that the textbooks are only partially correct when they refer to copper as a good marine cure.

"I am devastated that, in attempting to be a good aquarist, I used a product which killed almost all my marines. A sorry lesson to learn; but I will never use a copper-based medication in my system again."

I think a variation of a few degrees either should not seriously affect the vast majority of tropical fishes. I have not used a copper-based cure for many years so I feel unable to comment on Alan's findings.

CONTINUING ANGEL PROBLEM

Sadly, my problem with Angelfish continues. Only three of the last five young ones bought survive and grow. There seems to be some inherent problem in the tank — which houses a thriving population of various varieties of fishes. I've noted a slight pinkish colour in the aquarium water when some is removed and poured into a white sink, bucket or basin.

I've decided that the probable source is not a large, outside power-filter, but possibly bacteria living in the gravel in the aquarium. The gravel in use is crushed granite — chosen years

ago because it did not contain any soluble calcium carbonate pieces. The granite particles are of various sizes, some being relatively large — providing spaces into which detritus and waste food can sink.

Drop me a line if you can tell me something about red/pink algae or bacteria which might live in the spaces in the gravel and produce toxins that have been affecting a few sensitive fish. I assume that if a bacterium is the cause of the pink coloration, then it must be an anaerobic bacterium, as the gravel is unfiltered. Do you have any views on the subject?

The ultimate test would be to strip down the tank and replace the gravel — a formidable task! I shall embark upon this as soon as time permits.

UPDATED PICS

I updated my aquarium-fish photography equipment with a few new accessories during the summer. I've been quite pleased with the results.

Magazine and book illustrations suggest that monochrome photography is disappearing fast, to be replaced by colour.

I'm rather fond of black-and-white myself; a good such photograph is hard to beat, no matter what the subject. However, I must keep up with current trends and developments.

FUTURE TOPICS

Next month will be December, so Christmas looms large. Please send me your opinions on the following topics: (a) presents suitable for a teenage aquarist; and for an adult aquarist; (b) sources for live foods by post; (c) selling home-bred fish; (d) keeping 'coldwater' fish at tropical temperatures; (e) keeping 'tropical' fish at room temperatures; (f) pond care in winter; (g) your experiences of photographing or videoing your pet fish and aquariums; (h) selecting good, young Koi; and (i) your favourite aquarium book — general or specific.

Send your letters to me: **Billy Whiteside, c/o Aquarist & Pondkeeper, 9 Tufton Street, Ashford, Kent TN23 1QN.** I should be pleased also to hear from anyone who has recently started university and who is studying fishes and/or plants in aquatic environments.

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Koi Talk

By John Cuvelier



Feeling rather like one of those T.V. announcers apologising for a short break in transmission, I, too, must apologise to my readers for disappearing from my column without warning. In my case, however, this was due to a fairly serious family illness, the nitty-gritty of which I shall gloss over as quickly as possible!

My thanks must also go to the redoubtable David Twigg for coming to my aid in answering a sheaf of readers' Koi Questions. Thanks David!

Anyway, being more or less back to normal, I'll try to pick up the pieces and make a start.

COLLINS ON DAPHNIA

Now, what do you know about *Daphnia*? If, like me, you merely regard them as some form of livefood which fish fry appear to be partial to, then think again!



Daphnia with two developing young in its brood pouch.

Among several letters received from readers in reply to my recent question about 'cultivating' *Daphnia*, was one really outstanding piece from John Collins in Warwickshire. I learned things about *Daphnia* which I had not even dreamed of, and I am certain that John must be a leading contender in any competition to elect a 'Brain of *Daphnia*'. I feel sure that John will forgive me for mentioning the fact he is into his seventies and that a beak of a lot of knowledge has obviously been put to good use thereby.

For instance, did you know that *Daphnia* are all female, except at a certain part of the year? Also that there are different colours and 'grades' of these tiny animals? The colours John has noted include red, grey, brown through straw, and black, which are apparently useless for culturing purposes.

There was enough information in John's letter to provide an article on its own. Any offers?

One significant fact did emerge from all of the replies I received on the subject, and it was the fact that all had used yeast in some form as a breeding constituent, so next year I shall try again.

PHENOMENAL FRY

At the risk of you all getting fed up with chat about my fry, I must tell you about the phenomenal growth rate experienced this year. My hatching pool is choc-a-bloc with young Koi, to 6in (15cm), so much so, that I've been hard pressed to

find homes for them all.

One possible reason for the lively growth could, of course, be laid at the door of an early spring, giving the fry a head-start.

However, I also feel that the use of some new food played a part, too. One of the drawbacks which I used to find a bit of a chore was the crushing up of dry food. This is one problem which has vanished, thanks to the introduction of the range of Phoenix 2000 pellets. This really is amazing stuff, and one only needs to read the formula on the pack to realise that it's a good bit of stuff!

What impressed me as much as anything was the range of 5 sizes, starting with the tiny 1.5 mm, up to the chunky 8 mm. Now, why on earth didn't someone cotton on sooner to the usefulness of different sizes of food? If you have a pond full of different sized Koi, then it's a doddle ensuring that all the stock gets a fair share of food simply by mixing an assortment of each grade.

Another intriguing fact about Phoenix is its ability to either float or sink in apparently approximately equal proportions, although I'd be the first to assume that this is merely coincidence!

If I had one gripe, it'd be the fact that the makers do not appear to cater very eagerly for the smaller user, as I found the 5 kilo packs to be on the large size, particularly when you finish with an enormous amount left over. I'm aware that it will all be used, but I'd feel happier if smaller packs were pushed a bit harder in the literature.

That apart, I can't help feeling that 'Gold Line Feeds' are here to stay and will form a welcome addition to the existing range of fodder for our voracious pets, particularly in view of the stated claim that this is "an all-year-round food" down to 45°F/8°C degrees!

ALL PUMPED UP

For some time now I've been feeling a little fed up with the operation of my 'Jabsco' vacuum pump which continually stalled under the power of its 0.5 HP motor, together with the

so much water that topping up was a virtually continuous chore.

The problem was easily solved thanks to my friendly *Exchange & Mart* magazine. A new 1 H.P. motor running at 1500 R.P.M. was supplied for the surprisingly reasonable cost of £78, thus killing two birds with one stone (as it were). Life is now much easier.

Machine Mart Ltd. can supply a wealth of electro-mechanical goodies at VERY competitive prices, and can be reached on 021 358 7977 or through any of their many 'SuperStore' branches. Those readers having a mechanical bent should have no problems with the change-over, or fitting a new coupling.

WINTER REMINDERS

You should, by now, have become aware that winter's tentacles are already reaching out for our eager fingers. No doubt you've all finished your pre-winter maintenance, such as vacuuming, clearing away leaves etc; in fact, all those mundane tasks which seem to roll around annually. Well, you have, haven't you?

Something tells me that this year is going to be a real stinker as regards cold weather, so if you've any plans to provide some form of cold weather shelter, now's the time to do it. (No, I cannot afford to heat my pool!).

Personally, I'm really pleased that my small growing-on pond has now been double glazed thanks to a friend who came across a quantity of twin-wall polycarbonate sheet which, while it didn't actually fall off a lorry, did come as cheap as it possibly could! Ain't friends wonderful?

Our final chore will, once more, be to interlace miles of fine nylon line as a deterrent against one of our herons who has been overflying us with an evil eye. What with a greatly increased shoal of small Common Goldfish and Comets, thanks to a prolific spawning season, plus all our small Koi, I'm going to need eyes in my nether end this year!

Your next issue, believe it or not, will bring us up to Christmas. Saints preserve us! What-
ever happened to 1977?



WHAT IS A KOI?

Dr David Pool, of the Tetra Information Centre, tackles a deceptively simple and interesting question about everybody's favourite coloured carp.

The answer to the question could be very simple — or very complex — depending on the amount of time or space available. In everyday conversation, a Koi could be described as "a coloured carp originating from Japan", and everyone would know what you were talking about. But when you look into exactly what a Koi actually is, the answer becomes more interesting.

A SCIENTIFIC ANSWER

For the ichthyologist, identifying exactly what a Koi is, is relatively straightforward. Koi is the Japanese for 'Carp', which has the scientific name of *Cyprinus carpio*. While on this subject, it is worth pointing out that the widely used name of 'Koi Carp' is incorrect — you wouldn't say 'Carp Carp' — which is what this means.

The taxonomic classification of a carp is shown in the accompanying Table. As we progress down this classification, each 'group' has more characteristics in common with carp.

The Cypriniformes (or carp-like fishes) contains about 3,500-4,000 species, ranging from Neon Tetras, to piranhas and knifefish, to Koi. They are all characterised by having the so-called 'Weberian Apparatus', a characteristic they share only with the catfishes.

The Weberian Apparatus is a chain of bones linking the ear of the fish with the swimbladder; it greatly improves the sensitivity of the fish to sound and pressure waves. If a carp had to detect vibrations using its tiny inner ear, it would miss many of the soft or low frequency vibrations.

The swimbladder is much bigger and acts as an amplifier, ensuring that carps and catfishes can detect vibrations more accu-

Top left, Koi-rearing ponds in Niigata Prefecture, Japan — the home of Koi.

Top right, Common Carp tend to grow bigger than Koi and be a different shape. This one is called "The Yuppie" and lives in Broadlands lake, Hampshire (weight — 29lb!).

Above left, high quality Koi, such as this Kohaku are not as hardy as their 'wild' ancestors.

Above right, Koi: more than just a variety of carp.

ately than other fish. This is an obvious advantage when such vibrations often mean food or danger.

The catfishes and Cypriniformes are differentiated by a number of skeletal differences and in the shape of the swim-bladder, which is constricted into two sections in the Cypriniformes and completely divided in the catfish.

Further down the taxonomic chain, the fish in the family Cyprinidae are distinguished from the other Cypriniformes (e.g. tetras) by having pharyngeal teeth and a bony projection at the back of the skull, called a millstone. The pharyngeal or throat teeth are formed from the fifth gill arch and are used to grind and crush food against each other and against the millstone.

The Cyprinidae includes the majority of fish we keep in ornamental ponds, including orfe, rudd, goldfish and carps.

The number of pharyngeal teeth and their pattern is a very precise means of identifying the species of fish within the Cyprinid family. Carp, for example, have five teeth on each pharyngeal bone, arranged in three rows, with three teeth in the outer, one in the middle and one in the inner row.

IDENTIFICATION FOR FISHKEEPERS

For the majority of fishkeepers, such a careful examination would be impossible, and yet, Koi can still be easily identified from other pondfish.

This is by means of a number of external characteristics which are only seen on Koi. These include constant factors, such as fin ray counts and the presence of barbels. Koi can easily be differentiated from goldfish, for example, because they have two pairs of barbels around the mouth, whereas goldfish — irrespective of variety — have none.

The numbers of hard and soft rays in the fins also differs between carp and other fish. When describing the numbers of fin rays in a fin, the hard rays (used for protection and strengthening) are given Roman numerals and the soft rays (for support) are given Arabic numerals. In carp, the dorsal fin has 2-3 hard rays and 17-22 soft rays (or Dorsal Fin II-III 17-22). The other fins are as follows: Anal Fin III 5-6, Pelvic Fins II 8-9 and Pectoral Fins I 15-16.

Care has to be taken when using non-constant factors to identify carp. For example, carp can often be identified in a pond by their large size, but this is of no use when identifying small fish. Colour is also of limited use, as goldfish and, to a lesser extent, Orfe, can have the same colours.

Even scale counts, which are widely used within fisheries science to identify other fish, are not always of use for carp. Typically, a carp has 35-39 scales along its lateral line — but what about Doitsu (or Mirror Carp) and Leather Carp, which have few, if any, scales? For comparison, a goldfish only has 27-31 scales along the lateral line.

When identifying carp, we often have several non-constant factors which suggest the fish is a carp (e.g. shape, size, colour and scales) and certain other factors which pro-

vide more definite proof of identity (e.g. barbels and fin ray counts). If this is still not conclusive, it is necessary to look internally at the pharyngeal teeth, swimbladder and Weberian Ossicles.

DIFFERENCES BETWEEN KOI AND CARP

The fish that we all know as Koi is a variety of the Common Carp, *Cyprinus carpio*. As you might expect, both these fish are very similar in most ways and can also interbreed.

Coloration

The major difference is in the coloration, with Koi being more intensely coloured than the Common Carp, making them attractive in a pond, rather than ideal for eating or catching.

This coloration is entirely due to chance mutations and careful selective breeding. Koi were first bred in the Niigata Prefecture of Japan in the 1820's. Here, they were bred as a source of protein for the local farmers. These carp were predominantly brown (Magoi variety), although there were occasional mutations to give fish with red patches or a reddish sheen.

Selective breeding of these fish by the farmers gave rise to red fish and, by 1870, to white fish with red patterning (Kobaku variety). Subsequent selective breeding, which is still occurring at present, gave rise to the many varieties which are available today.

Scaling

In the early 20th century, Common Carp were bred with a few large scales, or with none at all. These carp are known as Mirror and Leather Carp, respectively, and were selectively bred by carp farmers in Europe to make them easier to process for food. Mirror and Leather Carp were exported from Germany to Japan in the 1930s and were bred with the Koi. The offspring with few or no scales were called Doitsu Koi.

Size

In order to provide more meat, and to improve the efficiency of carp farms throughout the world, fast-growing Common Carp have been selectively bred. These fish can reach weights in excess of 60lb (27kg) and reach lengths of almost 4ft (120cm).

In contrast, Koi are bred for their appearance and rarely grow to more than 30in (75cm) with a weight of 15-20lb (7-9kg). Koi also tend to be more streamlined, particularly when compared to the almost round appearance of large carp.

'Pedigree'

The selective breeding of Koi over a 150-year period has resulted in a number of different varieties. Just as in cats and dogs, this selective breeding to produce 'pedigree' fish has resulted in them being generally



Pharyngeal teeth — in this case, from a Golden Rudd — contain different numbers of teeth, allowing the various species of Cyprinids to be identified.

weaker than the original form of carp.

This makes them more susceptible to poor water conditions and infection by parasites. This peculiarity will have been noticed by many owners who have lost Koi in their pond, even though the carp, goldfish and orfe have remained healthy.

CONCLUSION

To conclude then, Koi are just varieties of the Common Carp (*Cyprinus carpio*) and, as such, can be distinguished from other fish by means of several external and internal characteristics. They are fish that have been selectively bred for ornamental ponds and are therefore brightly coloured so that we can see them.

It is, perhaps, because Koi are kept in ponds in our gardens that we give them names and become attached to them. As a result, they quickly become more than just carp.

TAXONOMIC CLASSIFICATION OF KOI

Phylum:	Chordata
Subphylum:	Gnathostomata
Class:	Osteichthyes
Cohort:	Teleostei
Super Order:	Ostariophysi
Order:	Cypriniformes
Sub Order:	Cyprinoidei
Family:	Cyprinidae
Genus:	<i>Cyprinus</i>
Species:	<i>carpio</i>

KOI CHARACTERISTICS

Barbels:	(<i>Cyprinus carpio</i>) 2 pairs around mouth
Pharyngeal Teeth:	3 teeth in front row, 1 in middle and 1 in back row
Fin Ray Counts:	Dorsal II-III 17-22 Anal III 5-6 Pectoral I 15-16 Pelvic II 8-9
Lateral Line Scale Counts:	35-39

OUT AND ABOUT

DORKING REVISITED

by Billy Whiteside

Photographs — unless otherwise indicated — by the author



Interpet's impressive Vincent Lane premises.

Exactly 20 years previously, I had visited Dr Neville Carrington and his staff at Interpet, in Dorking, and had had a most enjoyable time. After 20 years, I decided that it was time to travel down to Dorking again to see what Neville and his colleagues had been up to in the interim. I travelled from Belfast to London; and then took a morning train from Victoria to Dorking.

Dr Neville Carrington kindly met me at Dorking Station and chauffeured me round for the rest of my day out. Neville didn't look very different despite the passage of two decades, and I was amazed at how easy it was to resume a conversation that had been continued on paper only since 1972. Neville and I were soon chatting away happily and we were soon finding a parking space at Interpet's Vincent Lane factory.

The first thing that struck me was the amazing increase in size of Interpet. It is now an expanding business catering for the needs of a wide range of pets, and exporting products all round the world.

Dr Carrington has also branched out into the specialist business of producing high-quality scientific equipment. The main items I saw being set up were to measure the viscosity — 'thickness' — of liquids. I

asked Neville who needed to know the viscosity of liquids — thinking only of those producing petroleum products. One of Neville's greatest skills is his ability to make complex science seem simple, and to apply things that he and his staff discover, when experimenting, to provide solutions to different problems. I soon was made to realise that viscosity is important when one is dealing with any liquid. For example, if you upend your bottle of sauce and it all pours out in three seconds, they've got the viscosity wrong; or if you've got to squeeze out an inch of toothpaste from a tube and nothing comes out, they've got it wrong.



Connie Hughes: the 'service/repair department' at Interpet, checks a heater-stat.



Interpet's award-winning Pond Treatment Centre.

I was most impressed to see the vast range of products that Interpet manufactures for the aquarist and pondkeeper to use. One of the accompanying photographs shows the firm's award-winning display stand exhibiting a wide variety of pondwater treatments. An indication that the recession is virtually over in southern England was the fact that the Interpet staff had just gone onto overtime.

Another photograph shows a most important lady at Interpet. She is Mrs Connie Hughes who is virtually the Interpet Service/Repair Department. When something breaks down or does not function properly, it is passed on to Connie to make a



Super-healthy Green Chromis at The Coral Bazaar.

diagnosis and provide a solution.

I asked her what items presented the most common problem, e.g. heater/stats, pumps, filters. "Owners!" said Connie. She went on to say that most modern equipment is very reliable — unlike those who buy it. (We've all heard of someone who has let a heater overheat out of the water; or the mythical person who took back a supposedly-faulty air-pump after he tried to operate it submerged in the aquarium water. Well, Connie sorts out the problems caused by such people).

I was particularly interested

to meet Adrian Excell, who is the Development Manager at Interpet and who, with Dr Carrington, and Dr Chris Andrews, late of London Zoo Aquarium and now at Baltimore Aquarium, co-authored *The Interpet Manual of Fish Health*.

Dr Carrington took me to his home before lunch and I was delighted to see his personal fishroom. I was particularly struck by a tank housing a breeding shoal of White Cloud Mountain Minnows — which looked as good as Neons — and by tanks housing a variety of thriving plants. I was amused to hear that I had sent Neville some of the original plants in a case or two. He had a thriving colony of floating Indian Fern — *Ceratopteris cornuta* — and, needless to say, I left with one plant carefully placed in a polythene bag.

I was also very impressed by Neville's various coldwater fishes and ponds. He had three outdoor ponds; and a couple of large tanks of thriving coldwater fish in his garage. I asked about the age of some of the large coldwater fish in one tank — and was amazed to realise that I just might have seen them

on my last visit 20 years ago!

Dr Carrington treated me to lunch in a delightful, English pub; and then took me on a tour to see an aquarium shop in Dorking — where some of the Koi on sale cost about £286 — and a fascinating establishment out of town called the Coral Bazaar, the proprietor of which is Martin Cobbett, a former employee of Interpet some years ago. Martin had a vast array of fishes on display at his establishment and when I asked how many tanks he had in use, I got rather a surprise when I allowed him enough time to count up to 332! I found the coldwater section at Coral Bazaar very interesting, particularly the filtration system and the outdoor ponds. Marine fishes, such as *Ctenopoma caerulea*, on display almost converted me to the marine side of the hobby.

It was interesting to return to Interpet and see the fishroom there; and to hear some of the problems associated with the new EEC regulations as they affect aquarium and pond equipment.

It's amazing how time flies when one is having an enjoyable time — and that's exactly

what I have had on both visits to Interpet. It did not seem long until I was back on the station platform saying goodbye to Neville and thanking him for his kindness and courtesy.

Dr Neville Carrington is the sort of scientist, gentleman and hobbyist who gets our hobby a good name. He thinks that the branch of the hobby that will develop most over the next few years is the coldwater side. I think I'll have to agree because since seeing his coldwater fishes, in particular, I've been seriously considering setting up a tank of Fancy Goldfish at home after almost a decade without any coldwater fishes.

If you are in Surrey drop in at Coral Bazaar, Queen's Close, off Chequers Lane, Walton-on-the-Hill, Tadworth, and see Martin Cobber's fine show of fish on display and on sale in 1/4 mile of stocked aquariums. They are well worth a visit.

If you need some new equipment for your aquarium, or a treatment for your aquarium, fishes or pond, get a copy of the current Interpet catalogue. You'll probably be astonished at the vast range of goods, for all sorts of pets, being marketed by Interpet.

I certainly won't wait another 20 years before my next visit to Interpet!




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R WALKER
 Caister-on-Sea,
 Great Yarmouth,
 NORFOLK.

28th May, 1992

Dear Sir or Madam,

In this area recently there was an outbreak of fish diseases, the main symptoms being ulcerated bodies and fin-rot. The fishes also failed to eat and showed very frightened behaviour. My own case relates to a coldwater aquarium containing EXOTIC GOLD FISHES.

My local aquatic specialist was swamped with requests for your 'MYXAZIN' to such an extent that his normal one month supply was all sold out in 4 days!

Your 'MYXAZIN', used as prescribed, worked excellently and the fish are now, 10 days later, virtually fully recovered.

Many thanks for a magnificent product.

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Trade Talk

Plant Health Registration

OFI (UK) has alerted members that traders dealing with plants will need to register with MAFF in order to continue trading after 1 January 1993.

Registration is required for traders who import, produce, trade in, or supply, plants or planting materials. Businesses do not need to register if they are involved solely with direct retail sales to the general public and are not involved in plant production and propagation, or wholesale trading.

Exemption may also be granted to small growers or traders who sell exclusively to customers not involved professionally with the trade, or on a case-by-case basis.

Registration forms and an explanatory booklet *Plant Health and the Single Market* are available from local Plant Health and Seeds Inspectorate (PHSI) centres or from OFI (UK) offices (registered mem-

bers only), and registration is free and unconditional.

Following registration, an inspection will be undertaken by the PHSI of MAFF to determine if a business may attach Plant Health Passports to the plants it sells, and without which no plant may be moved.

According to OFI (UK), it is intended that a Plant Passport will enable specimens to be traded between any two places in the EC (whether in the same country or not) with equal ease. The requirement for Phytosanitary Certificates when exporting elsewhere in the EC will be scrapped, the Plant Passport serving this purpose.

Imports from non-EC member states will still require a Phytosanitary Certificate, and once in the EC, they will then require a Plant Health Passport. To be allowed to attach this to plants they sell, importers must be registered and inspected by PHSI.

Aqua-Soil Register

A county-by-county register of retailers who stock Aqua-Soil products is being compiled by the company, as a result of requests from consumers for information on local stockists.

The service is being advertised through the company's 1993 publicity campaign, and the register will also be used to distribute the company's new shop display pack for the coming season.

Stockists who would like to be involved with the register should contact Barry Read at Aqua-Soil, Bovey Tracey, Devon TQ13 3YP. Tel: 0626 835135; Fax: 0626 835585.

Business Award for Monty's Aquatics

David Montoya, of Monty's Aquatics in Brighton, has received one of 100 advertising

and marketing packages worth £1,000 from Thomson Directories, in conjunction with the Prince's Youth Business Trust (PYBT).

PYBT, led by its president, the Prince of Wales, has linked up with Thomson Directories in the sponsorship scheme, which helps young people to build their own businesses.

'New Wave' Products from N.T.

Measured dosage dispensers and colour-coded packaging have been introduced by NT Laboratories for their aquarium treatments. Launched under the name *New Wave*, the products for freshwater and marine aquariums are packaged in easily-identified 125ml canisters with an integral measure dispenser, to ensure accuracy of dose and avoid cross-contamination.

Eye-catching colour-coded containers in green, red and



New Technologies' eye-catching New Wave packaging.

yellow enable the products to be easily identified.

Commitment to Customer Care

Aquatic and pet products manufacturer Interpet is to extend its commitment to customer care: "It is our intention to delight our customers — not merely to satisfy them," declared managing director Mark Senior.

"This will be achieved by developing the company's international reputation for a combination of super products, the best service, and the best back-up available on the market."

The company is currently in the process of compiling a customer survey from their existing accounts to develop feedback, and is in the process of establishing BS5750 accreditation. One of the greatest assets of the company, added Mark Senior, is its staff: "We have a most capable management team with a highly-experienced chairman, Dr Nev-

ille Carrington; while our scientific and research and development team is second-to-none. In addition, the company is brimming with ideas and has a continuing programme of product development."

Mark Senior is keen to develop the scientific approach which the company takes toward product development and research. He believes the company is one of the few which can boast its own in-house research team and, while many companies have reduced their budget for research and development, Interpet has significantly increased expenditure in this area over recent years.

FIN END

"I don't know, son, ever since we got the parrot, the fish keep disappearing!"



SRI LANKA

Part 1

Reef Nurseries

Frank de Graaf, Emeritus Curator of the Artis Aquarium in Amsterdam, tracks down the 'secret hiding places' where young coral fishes spend their early days on the reefs of Sri Lanka.

Photographs by Arend van den Nieuwenhuizen

If one is lucky enough to have the opportunity of visiting the tropical reefs of Sri Lanka, then it is only natural to make a few on-the-spot notes about the natural habitat of the reef fishes that live there. Such notes are ever-welcome additions to body of data of the biology of the species found there, as, even today, there are many gaps in our knowledge of the life of coral fishes in their natural environment.

Admittedly, we have at our disposal plenty of in-depth studies of life on the Great Barrier Reef on the east coast of Australia, but most such studies — even recent ones — concentrate mainly on the lower animals on the reef and only to a lesser extent on the fishes. The reason for this is probably that the difficulties involved in observing fishes on a coral reef for any length of time can only be overcome with the help of modern technology; such observations are almost impossible from the surface, as the creatures are forever disappearing from view among the bizarre and convoluted forms of the corals.

The development of sub-aqua technology during the years since the second world war has made it possible, with the help of expensive equipment, to remain below the surface for long periods of time and, at the same time, to move from place to place quickly and easily. In the past, many expeditions have shown that such methods are genuinely of great value, and this has also been strikingly documented on television on numerous occasions. But, as the following report will demonstrate, observations from the surface can also be of value.

IDEAL CONDITIONS

It has long been known that young coral fishes are rarely, or never, seen or caught on the larger coral reefs. There are only a few species in which juveniles are found in the same habitats as adults. The population living on a coral reef always consists of full-grown and at least half-grown fishes, which raises the questions: Why is this so? Where do the young coral fishes grow up? Where do the adults breed?

The environment in which corals live, and where they build their immense and complex structures, provides them with ideal

surroundings. The factors which make up this environment are so favourable for life in the sea — as long as destruction by humans does not interfere — that almost nowhere else in the ocean can one find a habitat better suited to marine creatures. The corollary of this is that, not only do the corals thrive and proliferate, but also every part of the reef is occupied by the most diverse life-forms.

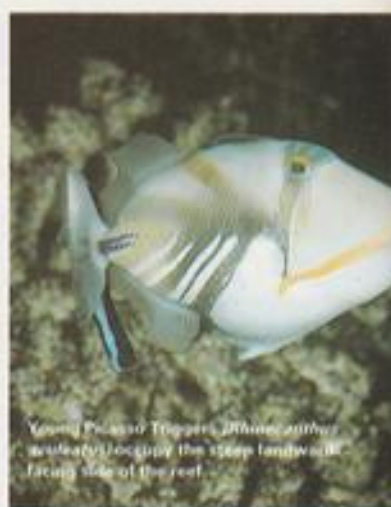
As well as the characteristic fishes — the coral fishes — one encounters numerous representatives of almost all the families of marine creatures. Growing between and on the corals there are gaudily-coloured sponges, tunicates (Sea Squirts), tube worms, molluscs, colonies of Bryozoans (Sea Mats), and numerous anemones. Fantastically shaped and coloured starfish and sea urchins, crabs and shrimps of every shape and size, scurry over and among the corals. Everywhere one looks on the reef one sees life, more life, and yet more life, both by day and by night.

DECEPTIVE FAIRY TALE

Of course, it is not only peaceful creatures that inhabit the reef. The abundance of living creatures has an almost magnetic attraction for predators, which conceal themselves among the bizarre colonies of corals and lie in wait for their prey, or swim slowly up to a shoal of unsuspecting fishes in order to launch an attack. At first glance, the coral reef resembles something out of a fairy tale, a peaceful fairy tale — but upon closer acquaintance, it reveals itself as an environment in which every individual has a hard fight for survival.

Because of the extraordinary abundance of life, there is a tremendous element of competition; every food item, every hiding place, has to be won. The coral reef is best compared with an over-populated city, in which acute housing shortages and meagre supplies of food in the shops are the norm.

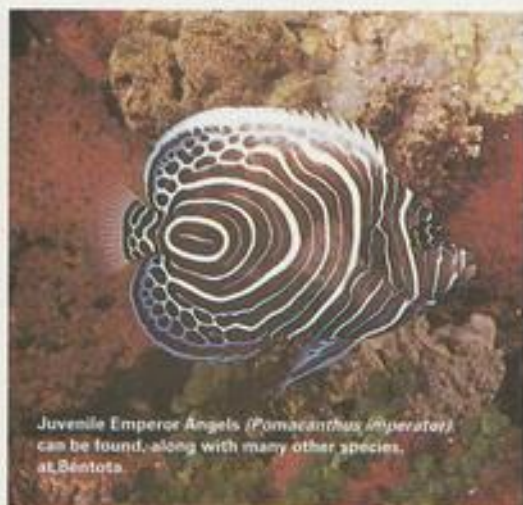
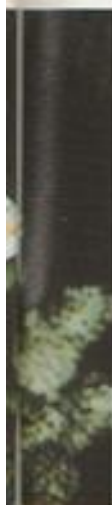
If one considers that every inhabitant of the reef lives under the threat of itself being eaten, then the fairy tale picture changes to a brutal reality, in which conflict is constant. It is clear that such an environment is no place for young creatures. The battle for existence would allow them no chance of attaining maturity.



Young Picasso Triggerfish (*Dinopoma lineatum*) occupying the shallow sandbank facing side of the reef.



The Striped Rockhopper (*Sparus fasciatus*) lives a solitary life in holes and crevices in the reef. It is often found in dead pools, where it remains at low tide. This species can be easily maintained in aquaria if fed generously on algae.



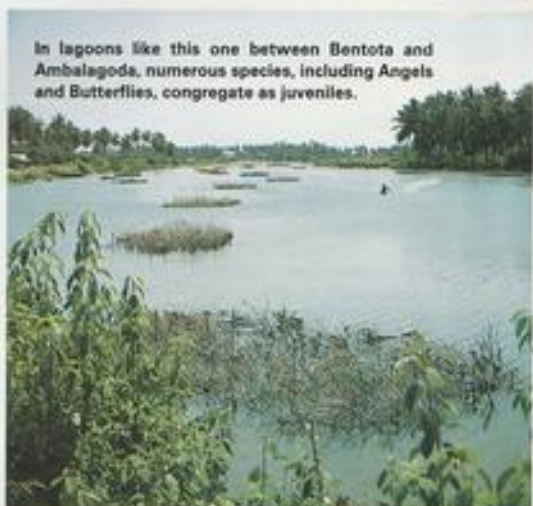
Juvenile Emperor Angels (*Pomacanthus imperator*) can be found, along with many other species, at Bentota.



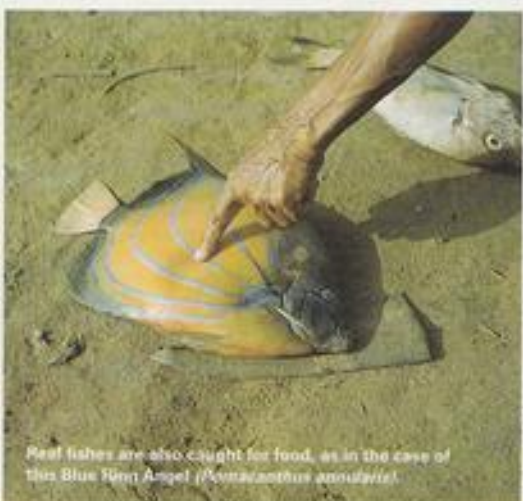
This juvenile Black Trigger (*Odonus niger*) was easily caught by hand by a boy in a tidal pool on the beach near Mount Lavinia. The water temperature was 37°C (98.6°F)! In the open sea, it was 31°C (87.8°F) at 1.30 in the afternoon.



The lagoon at Bentota, south of Colombo, is an ideal reef "nursery".



In lagoons like this one between Bentota and Ambalagoda, numerous species, including Angels and Butterflies, congregate as juveniles.



Reef fishes are also caught for food, as in the case of this Blue Ring Angel (*Pomacanthus annularis*).



Blue-striped Snappers (*Lutjanus kasmira*) live in massive shoals when adult.

REEF NURSERIES

But where then are these young creatures to be found? They must be born and grow up somewhere in order to populate the reef later on, as adults of a variety of species are met with in huge numbers.

How enormous these numbers can be is illustrated by the following observations. In the course of a fishing expedition in the bay of Trincomalee, a port in north-east Sri Lanka, during which we stationed ourselves above a large reef in a small fishing boat, we saw a shoal of Blue Striped Snappers (*Lutjanus kasmira*) which swam through the corals beneath us for a period of some four minutes. This shoal was so large that it was impossible to see the bottom between them — the fishes swam side by side. The width of the shoal was in excess of a metre. It is very difficult to estimate just how many Blue Striped Snappers swam beneath us during the four-minute period, but it must have been thousands and thousands. It seems worthy of note that many of these fishes were injured or bore scars. I think this observation dramatically illustrates the turbulent struggle for existence on a coral reef. Moreover, later on we regularly found adult Snappers which bore old scars, as well as new or partly healed wounds.

The nurseries of the coral fishes, or at least of a respectable number of different species, are found in quite different areas to the dwelling places of their parents. Firstly, one finds large groups of young coral fishes in shallow coastal reaches where the substrate is rocky and thickly coated with algae, often forming regular underwater 'forests'.

There are corals here too, but never — at least in Sri Lanka — in sufficient numbers to form huge continuous surfaces. As a rule, they take the form of isolated colonies of species which are not found on the reefs.

Furthermore, one finds juvenile coral fishes all along the coast in the numerous small lagoons which still have a passage open to the sea. These lagoons are very important localities, and, accordingly, I will describe one of them in somewhat greater detail.

LAGOON NURSERY

At Bentota, on the south-west coast of Sri Lanka, a reef rises from the sea at some distance from the coast. At high tide, the reef lies immediately beneath the surface and, at such times, there is violent surf. At low tide, the reef lies exposed. Between the reef and the shore is a small lagoon, shut off from the sea at one end by a sand bank; this sand bank connects the reef and the shore. At the other end, the lagoon is open to the sea.

The water surface in the lagoon is always calm, as the surf breaks on the reef. Only at high tide do the waves break over the reef, causing movement of the lagoon surface for a short period. The water is crystal-clear and nowhere deeper than 1.5 metres (c 5ft). The bottom consists of white sand and is strewn with rocks; in places, the sand is mixed with coral debris. The reef and the rocky bottom are covered by forests of green seaweeds, from which a few fine corals protrude.

The upper surface of the reef is covered with dead corals; they are so sharp, that going barefoot is an adventure. Among the dead corals there are small pools which are filled by the breaking waves. At low tide, these form the most beautiful miniature aquaria I have ever seen. Their sides are covered with all kinds of seaweeds in green, brown and red, and with low-growing corals and small anemones rooted on the rocks.

Among the seaweeds, small colourful gobies (*Acentrogobius ornatus*, *Bathygobius fuscus*, *Gobiodon citrinus*) swim with jerky movements. Here, too, juveniles of tropical Morays slither through the seaweeds. In addition, there are small and beautiful Wrasses (*Macropharyngodon ornatus*, *Haliichoerus nigrescens*, *H. marginatus* — the last two of these as juveniles) and Blennies (*Salaria fasciatus*, *Atriosalaria fuscus* and *Fatblennius* species) in these tidal pools. At the least disturbance, they dive like arrows and hide among the seaweeds and stones.


Among the stones on the lagoon bottom, and on the steep (here-and-there-collapsed) landward-facing side of the reef, there are, of course, many more species than in the tidal pools. In particular, young Surgeon Fishes (*Acanthurus triostegus*, *A. nigrofasciatus*, *A. lineatus*), young Trigger Fishes (*Rhinocanthus aculeatus*, *Sufflamen chrystopterus*), young Lionfishes (*Pterois volitans*), and various young Wrasses are very numerous. Less common are young Emperor Angelfishes and Koran Angelfishes (*Pomacanthus imperator* and *P. semicirculatus*). On rare occasions one meets with larger shoals of these species. They normally live singly or in pairs

as juveniles, as well when as adult.

The lagoons are the real nurseries; adult fishes rarely wander here. During our fishing trips we only once saw predatory fishes in the lagoons. There are young predators to be sure, for example, the Groupers, *Epispharus maru* and *E. caeruleopunctatus*, as well as the already-mentioned Lionfish. The number of food organisms in the lagoon appears to be adequate, as the young fishes grow almost before your very eyes.

As far as we were able to ascertain, other environmental factors differ a little from those on the large reefs. The temperature is generally higher, which is explained by the fact that the water is more or less stagnant between tides; also the sheltered position plays a part. At Bentota we recorded a temperature of 25-28°C (77-82°F) at 10cm (4in) beneath the water surface. Moreover, the salinity is somewhat higher than on the large reefs. There, it is generally 34 parts per thousand (34‰); in the small lagoons it varies from 34-36‰. Occasionally, a small stream flows into a lagoon, and, in such cases, the salinity decreases and varies between 29 and 33‰.

But the juvenile marine fishes do not remain in their lagoons for long. Shortly before they are half-grown, they suddenly disappear from these safe places and begin their journey to the home of their parents, the coral reefs. We found that we could catch rather large numbers of half-grown Koran Angelfishes, Emperor Angelfishes, Wimplefishes, etc. in the open coastal waters, at a depth of 2-3 metres (6.5-10ft).

(TO BE CONTINUED) 



Books

Giant Lizards

By: Robert G Sprackland
Published by: T.F.H. Publications Inc
ISBN: 0-86622 634 6
Price: £49.95

There's a beautiful photograph on page 127 of this large and profusely illustrated book. It is of the author, Robert Sprackland, cradling a 7ft 6in Water Monitor known as Puff. The expression on the author's face sums up, to me, many of the numerous reasons why this book is so good.

Clearly, Robert Sprackland loves giant lizards... and enjoys getting as close to them as he can. Add to this, tremendous writing skills and detailed academic knowledge and practical experience at keeping these reptiles, and you are bound to end up with an excellent book.

There's, at least, one other factor, of course: the willingness and ability of a publisher to take on a subject that is not very likely to hit the Top Ten in the sales ratings, but which will nevertheless provide an essential and otherwise unavailable service for those herpetologists and zoos who have the desire and facilities to keep and exhibit these animals. I therefore very warmly applaud TFH for having undertaken to publish what should undoubtedly become the large-lizard-keeper's bible.

It's hard to fault this book, and I don't intend doing so. Even the artwork, which I have adversely commented on in connection with some other books, is of a better quality this time (at least, it is certainly acceptable). As to the photographs, well, seeing is believing; some of them are truly outstanding.

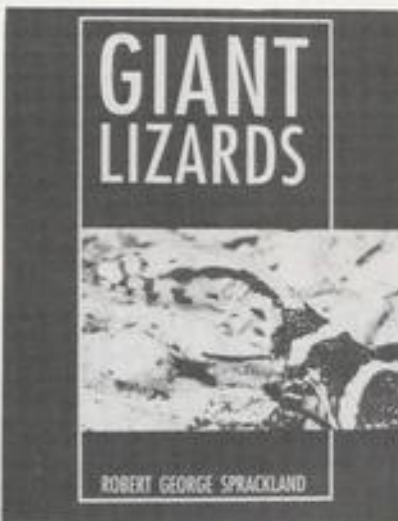
Almost by definition, *Giant Lizards* contains a great mixture of species. They are organised by family but, of course, not every species of every family is included — only those which grow to around 20in (c 50cm) or over. Therefore, we have a few Chameleons, but only a few; some Skinks, but only some; some Agamids, and so on. In fact, the collection of species is, as the author says, "a totally artificial assemblage of animals, chosen on the arbitrary basis of size"... but what an artificial assemblage!

In addition to chapters on the Varanidae (Monitors), Helodermatidae (Venomous Lizards, including the Gila Monster), Teiidae (Tegus and Caiman Lizards), Agamidae (Agama Lizards), Scincidae (Skinks), Iguanidae (Iguanas) and Miscellaneous Giants (taking in some chameleons, the Giant Gecko, African Plated Lizards and Lacertidae), there are excellent sections on husbandry, veterinary care, the law and, even, careers in herpetology, plus a good Glossary and Bibliography (which includes an article on Monitors by Daniel Bennett which was published in *A & P* in June 1990).

My overall verdict: *Giant Lizards* is an

exceptionally good book, at an excellent price, and deserves to become the best-seller in its category.

John Dawes



Freshwater Fishes of the British Isles

By: Peter S Maitland and R Niall Campbell

Published by: Harper Collins
ISBN: 0 00 219380 9 (Paperback)
0 00 219383 3 (Hardback)

Price: £14.99 nett (Paperback)
£30.00 nett (Hardback)

Also available from: Steven Simpson
Natural History Books, PO Box 853,
Brighton BN1 5DY. Tel: 0273 727328; Fax:
0273 203754. (Add £2.50 per item to cover
postage and packing.)

Did you know that the olfactory senses of carp are no fewer than two million times keener than those of humans? Or that the finding of Dace bones in an excavation site near the River Stour in Dorset suggests that this species was present there as long ago as 500 BC?

Even more staggering, perhaps, are the facts that, in Great Britain as a whole, there are over 10,000 individual river systems entering the sea, while inland, there are over 81,000 ponds, lakes and reservoirs. There latter have a surface area of 2,404 square kilometres, which represents 1.04% of Great Britain.

There is more than one word which sums up *Freshwater Fishes of the British Isles*, from which the above information is extracted, but the one which springs immediately to mind is *comprehensive*. If you are a fishkeeper (or an angler or conservationist) who wishes to find out more about the fish of the British Isles, their habitat, physiology and

behaviour, then you will find this fine volume to be a constant source of reference. (Indeed, I had intended to produce this review a month earlier, but got so involved with the book that, as they say, I just couldn't put it down!).

Comprising in excess of 360 pages, including 21 colour photographs and over 200 black-and-white photographs and diagrams, *Freshwater Fishes*, the latest in the *New Naturalist* series from the publisher, is a 'serious' book for the 'serious' fish enthusiast and those who wish to find more from their hobby. Not that this is heavy-going. Its informative style is crammed with facts so, yes, it does require some study. But its presentation makes for a fine read and an easy reference on just about everything you may never have known about British freshwater fish.

The first part of the book investigates such subjects as form and function of fish (including some spectacular black-and-white photographs showing general characteristics of fish scales, and a study of fish physiology and behaviour); investigation of fish; their distribution and habitat; fish conservation; and identification of fish.

Further chapters provide in-depth and finely detailed studies on individual species of fish, right down to the last scale and fin ray, including Lampreys, Sturgeon, Chads, Salmon, Trout and Char, Whitefish, Grayling, Smelt, Pike, Carps, Loaches, Catfishes, Eels, Sticklebacks, Cods, Bass, Sunfish, Perch, Bogies, Mulletts, Sculpins, and Flatfish.

A final chapter looks at the future. What can be done to rectify mistakes of the past? ask the authors, while appendices provide: distribution maps; a list of names and their origins of British freshwater fish; and growth curves of no fewer than 62 fish. Complementing the volume are most comprehensive bibliography and references sections, as well as, of course, an index — a pre-requisite of any reference book worthy of the stature.

A health warning here: if you are seriously into fish, then you will be seriously into this book. If you are not (yet) seriously into fish, then you will be, after reading this fine volume.

Stephen J Smith

Living Fossil (The Story of the Coelacanth)

By: Keith S Thomson
Published by: Hutchinson Radius
ISBN: 0 09 175115 2
Price: £15.99

There's a touch of the almost-mystical about the term 'Living Fossil', as if there's something extra-special about such living creatures. Well, perhaps there is

(although I have considerable doubts myself).

My problem (if it is a problem) is that the Coelacanth would be every bit as special in my eyes if it represented the 'end-point' of an evolutionary lineage, instead of it being a large fish that has seemingly remained unchanged for around 70 million years.

By any yardstick, the Coelacanth is a very remarkable fish, one that has captured the imagination of numerous ichthyologists over the years. Interestingly, as Keith Thomson points out, "...there are more self-appointed experts on the Coelacanth than there are specimens" — a sobering thought ... perhaps.

Perhaps Coelacanths are more numerous than we imagine. Perhaps they have such retiring habits that catching them is next to impossible. Perhaps we have not really been looking in the right places. Perhaps they are close to extinction. Perhaps ... perhaps. ... The inescapable fact is that there's a great deal about this fish that we don't know.

The Coelacanth is generally regarded as ugly, but is refreshingly referred to as "the most beautiful fish I have ever seen" by Marjorie Courtney-Latimer (after whom the genus was named), the 'discoverer' of this bluish-bodied, pinkish-white-blotched 6ft living fossil.

Keith Thomson unravels the interweaving story of the Coelacanth from Courtney-Latimer's day to the present, neither glossing over the less accurate and outlandish claims, nor blinding the reader with science,

or making science appear as the perfect objective discipline it's often made out to be. *Living Fossil* is riveting reading (at least, I most certainly found it so) and tells a fascinating fish story like no other.

For those of us who have a special interest in livebearers, the Coelacanth holds particular fascination. Not only is it a livebearer, but it is a pretty unusual (some of us might almost be tempted to say, advanced) one, too. Females 'ovulate' and embryos develop in a uterus (womb); there's even embryonic cannibalism!

I first came across these absorbing facts when I was researching my own book on livebearers a few years ago (and was subsequently, and regrettably, misquoted by a reviewer who somehow thought that I believed the Coelacanth to be an egg-layer). The further I went into Coelacanth biology, the stronger my affinity for the species

became, until I was left wondering just how primitive it really was.

After all, internal fertilisation requires intimately co-ordinated behaviour, especially when males don't possess a distinctive intromittent organ like 'normal' livebearers do. On top of this, courtship and mating are probably carried out either in semi- or total darkness. Then there are the other aspects of reproductive biology documented by Keith Thomson. Makes you wonder, doesn't it(?) how a primitive fish could be so 'sophisticated'. But then again, true fossil Coelacanths have also been shown to be viviparous. Interesting. . .

If you are looking for a 'fishy' book that is a total departure from the practical guide-books and provides an enthralling window into the life of the world's most famous fish, then look no further than *Living Fossil*.

John Dawes

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