OCTOBER 1992

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AQUARIST & PONDKEEPER

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EDITOR
John Dawes

ART EDITOR
Ian Hunt

ADVERTISEMENT MANAGER
John Young

ADVERTISEMENT PRODUCTION
Gwen McNeil

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TELEPHONE: ADVERTISING AND PRODUCTION
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FAX NUMBER
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## Features





**TROPICAL FRESHWATER SUPPLEMENT**
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## COMPETITION



## Regulars



## COVER STORY — GOLDEN TREVALLY

*Photograph: Max Gibbs, Goldfish Bowl, Oxford*

The Golden Trevally (*Gnathanodon speciosus*) is also sometimes referred to in the literature as the Pilot Fish. In Hawaii, where specimens have been successfully raised from the egg stage, it is known as the Yellow Ulua.

This beautiful, active shoaling species in not an ideal fish for beginners, attractive though juvenile specimens undoubtedly are. Adults are also quite spectacular too, but they can reach about 3ft (90cm) in length and therefore require very roomy accommodation.

The Golden Trevally belongs to the family Carangidae, known popularly as Jacks or Pompanos. As such, these fish are primarily open-water, surface swimmers with predatory habits: all good reasons why, desirable though these fish might be, they can present quite a challenge, especially once they begin to put on some size.

Golden Trevallies are unusual among Carangids in that they possess a lot of yellow on their bodies, whereas their closest relatives are all predominantly silvery.

# Editorial

## UPLIFTING POND EXPERIENCE

I had a uplifting experience, in more senses than one, in June. Part of my birthday present was a surprise hot air balloon ride over Bristol and the surrounding area. It was absolutely magical and I lapped up every single second I was up there.

Views into the Bristol Channel and the River Severn on one side, and the gentle expanses of our "green and pleasant land" on the other — allied to the ghostly silence, only occasionally pierced by the awesome power of 'the burn' — provided a novel, exciting... and very revealing perspective of the world.

One of the great things of 'being up there' is that you can peer down onto the world below — a sort of legal form of poking your nose into other people's privates domains. No-one seemed to mind, though. In fact, most people simply waved at us, while some children shouted up: "Can you hear us?"... to which we promptly replied: "No!".

Looking down into the postage-stamp-sized gardens (that's the way they appeared from a couple of thousand feet up), I suddenly realised that I had been, unconsciously, counting ponds as we glided along. What brought this instinctive tendency into the world of conscious realisation was a question from one of my fellow balloonists. "What do you do for a living?" he had asked.

JOHN DAWES

**A particularly 'rich' area in terms of ponds, on the outskirts of Bristol. How many can you count? I counted eight (or nine).**

Jolted back into the realm of consciousness, I started to keep a firmer count. What I did was select an 'island' of houses as it came into view directly below me, and counted the number of ponds in gardens for a period of about one minute. After a break of some five minutes enjoying the more general scene, I'd return to the activity for another minute... and so on.

In the end, I came up with figures of one pond in every 9-12 gardens. Quite heartening, I thought, in view of the fact that the name of our magazine is *Aquarist & Pondkeeper!*

Some years ago, figures being bandied about suggested that something like one home in 20 owned a pond. By 1987 Mintel had reported about 8% ownership, ie about 1.6 ponds per 20 homes. In their report presented at the Sparsholt College Conference in July '91, this figure had been revised up to 11% for 1990, ie 2.2 ponds/20 homes.

I sincerely hoped at the time that they were right, but I must confess that I had a sneaking suspicion that 11% might have been a little optimistic. That's why I felt so uplifted by my own 'hot air' count. It seems that Mintel were right.

Now, if this is the trend during a period of recession, what will a brighter, livelier economic climate bring... 20%... 25%..., or even better? Next season might well give us the first clues. Roll on the next Mintel survey.

John Dawes
Editor

### DRAGON FISH NEWS

Following our editorial entitled **CITES and the Dragon Fish,** in the June edition of *A & P,* we have recently received most encouraging news from Mr Leslie Cheong, Head of the Aquaculture Branch of the Fisheries Division of Singapore's Primary Production Department. Please see **Letters** on page 16 of this issue for all the details.

# News Desk

## All Set For BAF '92

Excitement is mounting for the **41st British Aquarist Festival,** which takes place on **Saturday** and **Sunday 31 October** and **1 November.**

The festival is one of the major dates in any aquarist's calendar and the organisers, the **Federation of Northern Aquarium Societies (FNAS),** in conjunction with *Aquarist & Pondkeeper,* report that there has already been a tremendous response from the trade, who are presenting a wide display of fish and equipment for sale to the public, as well as information and working models for newcomers to the hobby.

Talks and slide shows will be provided on both days of the show, by leading aquatic experts, with the line-up of guest speakers including **Dr David Pool** of Tetra, **Dr David Ford** of 'Aquarian', **Brian Walsh,** *A & P* editor **John Dawes,** and our regular 'Cold-water Jotter' **Stephen Smith.**

The show will also include

JOE NORTHCOTT

**Last year's Champion of Champions: a tremendous *Theraps (Cichlasoma) bifasciatum* owned by Mr and Mrs Byrom. What other equally outstanding fish will replace it this year? Come to the BAF to find out.**

children's entertainment from Ferdie Dee the clown, while an up-to-date information service on all aspects of the hobby is provided by the FNAS stand. *A & P* has, once more, sponsored the **Champion of Champion** awards, where the best fish from every society Open Show in the UK is eligible to enter. Judges have been invited from all over the UK, and every exhibit will be fully pointed, with judging sheets available for scrutiny at the FNAS stand.

The festival takes place at **Bowlers Exhibition and Conference Centre, Longbridge Road, Trafford Park, Manchester,** only a few hundred yards from junctions three and four of the M63 motorway. A half-hourly bus service, provided free of charge, will operate between the main Manchester bus and train stations.

A special BAF weekend accommodation package has been organised by FNAS in conjunction with **Manchester Airport Hilton Hotel.** The package is priced at only £27.50 per person sharing a twin or double room and includes English breakfast, VAT and service. Bookings for the hotel package should be made direct to **Manchester Airport Hilton Hotel Reservations Department (Tel: 061 436 4404; Fax: 061 436 1521)** quoting code BAF '92 to qualify for these special rates.

Further information about the exhibition, including trade space, schedules and entry forms, is available from **Arnold Chadwick, 9 Bronville Close, Chadderton, Oldham OL1 2RH. Tel: 061 652 6207.**

## Brazilian Conservation Benefits From 'Recycled' Books

"The jungle has been good to me during my lifetime," according to **Dr Herbert Axelrod,** who is well-known throughout the world for his enthusiasm and dedication towards the aquatic hobby and his business of pet book publishing.

Now largely retired, Dr Axelrod wishes to help protect the jungle and has founded the **Dr Herbert R Axelrod Foundation,** a non-profit organisation dedicated to buying land in Brazil for conservation and study and to protect it from exploitation.

An area in Ceara in Brazil has already been purchased for this purpose.

To help fund the foundation, **TFH Publications, Inc** is publishing a new series of books about keeping various pets. The new "... as a Hobby" series is printed on recycled paper and all materials used are recycled, while the publisher's profits from sales of the books will be passed on to the Dr Herbert R Axelrod Foundation.

The initial eight titles in the series cover snakes, iguanas, guinea pigs, cockatiels, budgies lovebirds, rabbits, and kittens; it is anticipated that a number of aquatic and herpetological titles will be released in the near future.

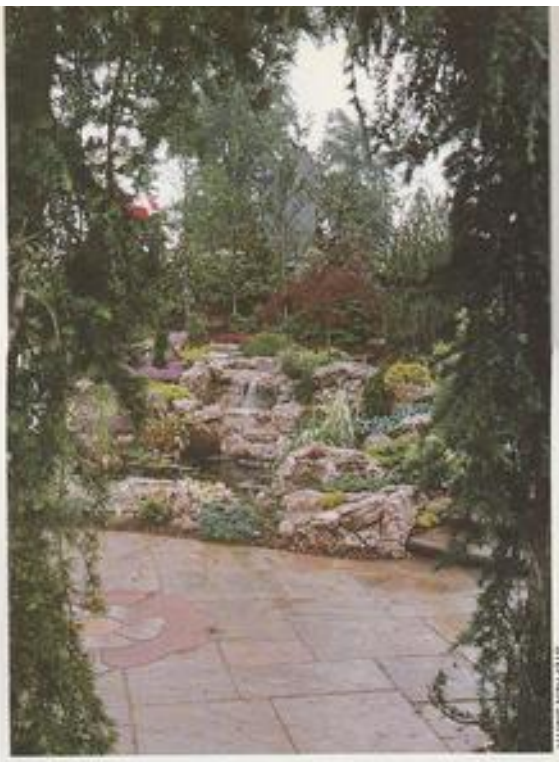
## Hampton Winners

These columns are pleased to announce the winners of competitions held by exhibitors at the aquatic village at **Hampton Court International Flower Show** in conjunction with aquatic wholesaler **C J Skilton** at Hampton Court.

1 **Jack Stillwell,** a retired schoolmaster from Portsmouth and an FBAS judge, was the winner of two free tickets to the show, having answered correctly three historical questions about Hampton Court in a competition organised in conjunction with the **Federation of British Aquatic Societies.**

2 In conjunction with *Aquarist & Pondkeeper,* the competition posed a question about the Longwater, the major aquatic feature in the grounds of Hampton Court, and the winners were, **R Bradnick** of Lowestoft, **B St Durling** of Trowbridge, and **R J Platford** of Upminster; who each won a pair of tickets and all expenses paid to the show.

3 The prize of a weekend break for two at the **Tytherleigh Cot Hotel** in Devon was



STEPHEN SMITH

**Winners of the various Hampton competitions arranged by C J Skilton Aquarist, won (among other things the opportunity to see some great water displays such as this one . . . absolutely free.**

## Appeal Over Disappearing Aquario

An appeal has been issued to hobbyists and retailers to be on the look-out for small cylindrical and multi-sided 'jars' sold for use as aquaria. Some of these jars hold as little as one litre of water and are similar in appearance to the glass cylindrical jars used for storing spaghetti. They have been marketed under the name **Aquario.**

Following complaints received by *A & P,* OFI (UK), and several well-known aquatic companies, the appeal has been issued by the Licensing Section of Hammersmith and Fulham Trading Standards Office, which is currently investigating unusual claims made for this range of products. The whereabouts of Aquario and its personnel is also being investigated. It is reported that when a visit was paid to Aquario's premises by the Licensing Department, it was found that livestock had been abandoned; very little of this had survived.

**OFI (UK)** has condemned the practice of abandonment of stock and does not approve of the products and the claims made for them by Aquario. *A & P* is similarly disapproving of both the keeping of fish in any container which is unsuitable for the purpose, *and* of the abandonment of fish, to their inevitable demise.

Any information which may assist these investigations should be addressed to **Mr Chris Reynolds** at the Licensing Section of the **Environmental Protection Division** at **Fulham Town Hall, Fulham Broadway, London SW6 1ET. Tel: 081 748 3020.**

awarded as the prize in the competition organised with **Lowara (UK)** to **Mr Gaston** of Canterbury; while £50 vouchers to spend at the hotel were won by **P Warren** of Eagle Models, London SW18, **W Williams** of Willis Engineering, Pyle, Mid-Glamorgan, and **J Short** of Glenfield Marketing, Leicester.

## Beluga Whales' First Birthday

A ten-day celebration of the first birthday of its two Beluga Whales was held during August at **New York's Aquarium for Wildlife Conservation.**

The young whales, **Casey** and **Hudson,** represent the only Belugas to reach their first birthday in any aquarium in the world, and the celebrations included whale music, folklore story-telling, artwork, and a presentation of a "whale of a birthday cake". The celebrations also provided a valuable opportunity to salute the various wild-life conservation aims of the aquarium and its parent company, the **New York Zoological Society.**

Flashback to August '91: birth of one of New York Aquarium's Beluga Whales.

In addition to the birthday bash for these "princes of whales", visitors were invited to attend presentations of performances by Bottlenose Dolphins and of diving and swimming sea lions.

FOR THE VERY LATEST AND THE BEST IN THE AQUATIC WORLD, MAKE SURE YOU TUNE IN TO NEWS DESK EVERY MONTH.

# OUT AND ABOUT

## WORLD OF KOI

**By Nigel Caddock**

*Photographs: Nishikigoi International*

There are some excellent Koi retail outlets in the UK, and there are also some excellent pond construction specialists, **World of Koi** in Bromley, Kent, have spent the last six years or so developing their business to offer their customers the best of both these key disciplines.

In early 1986, WOK proprietors **Rod Gilbert** and **Steve Hickling** began a three-month development project that turned a large semi-derelict storage building into one of the UK's top Koi retail outlets, and when WOK opened in March 1986, the epic transformation was complete.

An on-going investment programme culminated, in 1991, in the addition of a new suspended ceiling designed to enhance the impression of space and light. The stunning centre-piece sales pond holds 10,000 gallons (some 45,000 litres) and is much more than just a sales pond. As well as providing excellent water quality, it also features some of the pond construction and landscaping ideas WOK have built their reputation on, and quite unusually for contemporary sales ponds which often tend to be more functional than aesthetically pleasing, the WOK main pond is also extremely attractive.

WOK, 1992.

In addition to the main pool, WOK have seven other sales ponds which offer Koi spanning the complete price spectrum; an extensive range of Koi-related dry goods is further supported by a good selection of other coldwater fish and aquaria.

World of Koi were one of the first to recognise that, in addition to Koi and Koi-related goods, many Koi keepers also often wanted information and help in the field of pond design and construction. With many years pre-WOK experience in this highly specialist area, it was a natural progression that Rod Gilbert rapidly developed this part of the WOK business to the point where, now, more than six years later, the WOK design team, under Rod's highly innovative and professional guidance, have developed an unrivalled country-wide reputation for pond building excellence.

More recently, this service has been further enhanced by the availability of a specially developed computer-aided design package, by which details of pond landscaping requirements can be added to details of the existing garden layout to provide clients with a complete pond and garden visualisation service, enabling the new finished pond to be previewed via computer graphics and on hard-copy, before a spade is even put into the ground. Impressive stuff!

This highly original development offers WOK clients significant benefits and has resulted in a major growth in this aspect of the business which now keeps a team of specialist master craftsmen fully occupied.

Rod Gilbert and Steve Hickling have, using traditional values of high quality service and pride in their work, successfully etched a niche in the Koi market for their particular style of pond building expertise. Add to this a complete Koi and pond maintenance service, the wide selection of Koi and related dry goods they have available, and lots of free, friendly, expert advice, and the result is an excellent all-round Koi retail outlet with a market-leading pond construction service.

Contact: **Rod Gilbert** or **Steve Hickling** at **World of Koi, Bencewell Farm, Oakley Road, Bromley, Kent. Tel: 081 462 9479; Fax: 081 462 7883.**

**WOK, building before renovation, winter 1986.**

**WOK, informal design.**

**WOK, formal design.**

# THE AQUARIUM

## 'THE REST'

Part 8

In the final part of his long-running series, **Andy Horton** discusses the invertebrate marine creatures not included in the previous articles.

Below, sponges are extremely widespread and often don't even look like animals. This is a toxic red sponge (appropriately) from the Red Sea.

CORAL WORLD — ELAT

Animals have not evolved in tidy, convenient categories to suit the taxonomist. Even the title 'Minor Phyla' to group animals not mentioned in the previous articles is a misnomer, as some of these phyla are extremely important in zoological terms, especially the numerous worms. As far as the aquarist is concerned, the mixed bag that follows is a selection of the most interesting remainder, some of which are inadvertent pests.

### PORIFERA (SPONGES)

To the untrained eye, these sessile and colourful organisms are likely to appear as plants. It is only when looked at under a microscope, that sponges can be revealed as primitive animals, feeding on organic matter that is absorbed with seawater through small pores that cover the surface of the creature (see also: **Sponges — the True Survivors** by Peter Bienias, in the April '92 issue of *A & P*). The water is expelled through openings, called *oscula*, which can be seen clearly in the Breadcrumb Sponge, *Halichondria panicea*, found on British shores as a green spongy mat on the upper surface of the rocks from mid-tide level and below.

British seas are well supplied with sponges, but it is when you dive into tropical waters that a full range of various shapes and sizes can be viewed. Species available to the aquarist include Orange Cup (Axinellid) Sponges from the Indo-Pacific, which grow into the shape of a cup or vase. Others like the Brown Encrusting Sponge, *Neofibularia irata*, form mats, and some develop into wide fans like the large yellow Fan Sponge, *Ianthella basta*, or form a tubular purse-shaped animal in bunches, or as a lone individual. The original Bath Sponge collected by Glaucus is the species *Spongia officinalis* from the Mediterranean.

Sponges are the earliest of the Metazoans[6], evolving over 600 million years ago, in the Precambrian period, and have remained virtually unchanged since then, although in tropical waters, they have been extensively displaced by the more successful corals.

Four classes of sponges occur, with different skeletons:

**Calcarea** — calcium carbonate spicules
**Hexactinellida** — silicious spicules
**Demospongiae** — silicious spicules, some with spongin fibres
**Sclerospongiae** — silicious spicules, spongin fibres and calcium carbonate

Reproduction can occur from fragments of sponge broken off from the original colony, or by sexual means.

Nutrition is obtained in two ways, by organic particles and bacteria brought by the currents, or through symbiotic algae living within the tissues. In coral reef and littoral sponge species, zooxanthellae[7] algae provide a large proportion of the intake. Successful aquarium species are likely to be those from deeper water which contain blue-green algae which require less light. Liquid invertebrate food is suitable for sponges. Loss in aquaria is most likely to be from starvation.

### CTENOPHORA (COMB-JELLIES)

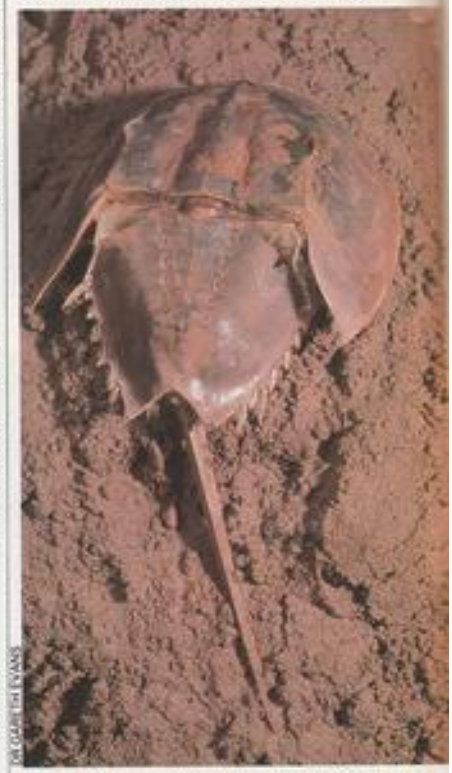
These interesting jellyfish-like animals are generally found in the surface waters, while luminous forms can occur at great depths in the oceans.

Comb-jellies lack the *cnida*, or stinging cells, of true jellyfish. Generally, they are not suitable aquarium species although British aquarists will keep the delicate Sea Gooseberry, *Pleurobrachia pileus*, as a temporary exhibit. The oval body will be 3cm (1.2in) long, with tentacles up to 30cm (12in).

### PLATYHELMINTHES (FLATWORMS, FLUKES, ETC)

This is a very important phylum with over 12,000 species, divided into four classes, of which three comprise parasitic species of flukes and tapeworms.

A few species of tapeworm are attractive free-living inhabitants, including the Candy-striped Worm, *Prosthecereaus vittatus*, of British seas. Monogenetic flukes are flatworms that appear as external parasites hooked on to the body of a fish. Trematodes have a complex life cycle involving several hosts, including sea birds and fish, and



DR GARETH EVANS

Among the so-called anthropods, the Chelicerata include the fascinating Horseshoe Crabs.

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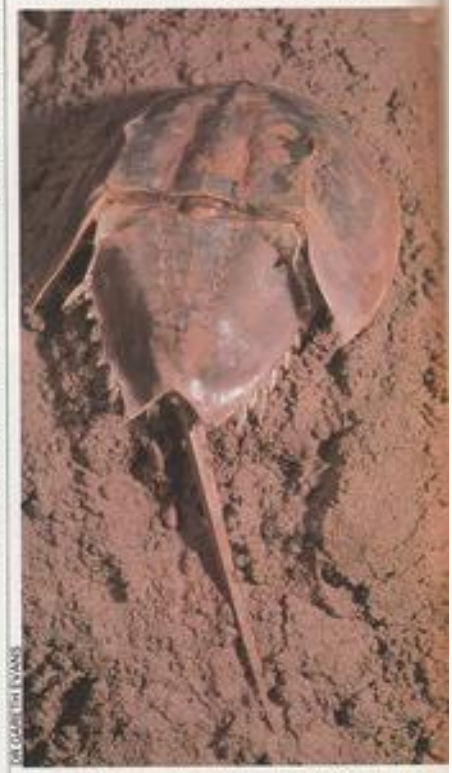


DR GARETH EVANS

Among the so-called anthropods, the Chelicerata include the fascinating Horseshoe Crabs.

# MARINES REVIEW

BILL TOMEY

*Hermodyce casunculata* — a predatory marine Polychaete worm.

BILL TOMEY

Among the best-known Polychaetes (as far as aquarists are concerned) are the graceful Fan or Tube Worms.

Cestodes, or tapeworms will develop in the gut of a fish. Only heavy infestations are harmful, although they may be unsightly.

## NEMATODA (ROUNDWORMS)

Nematodes form another important phylum, with in excess of 10,000 species of white roundworms that are invariably found as parasites in the intestines and other parts of wild-caught fishes. They are also found in large numbers on the shore, in crevices and among the seaweeds. Many species are likely to spread in aquaria, but this may not even be noticed.

## ROTIFERA (ROTIFERS)

These miniature animals (also referred to as 'wheel animalcules') are mainly freshwater species, and their main interest to aquarists is that they are available as cultures to feed fish and invertebrates that consume minute zooplankton. Most pondwater will contain rotifers.

## ANNELIDA (SEGMENTED WORMS)

This large group includes the Polychaeta, the segmented worms of the sea that include the Lugworms and Ragworms used as bait.

However, of greatest appeal to the aquarist are the types of Tubeworms that live in mucus tubes secreted by the animal. The worms will poke a fan of feathery gills from the tube to extract particulate nutrition from the passing currents. There are many species of Sabellid or Fanworms found in all the oceans, including the Peacock Worm, *Sabella pavonina* of the Mediterranean and British seas, which has proved easy to keep if it is not attacked by aggressive fish.

Of the Serpulids that live in a stony tube, the Christmas Tree Worm, *Spirobranchus giganteus*, is a particularly attractive species that lives naturally among the coral heads and is available in shops. Down on the British shore, the Keelworm, *Pomatoceros triqueter*, lives in white limey tubes, and sports gills of red or blue.

Some tropical worms are aggressive carnivores, and certain species of Bristleworms and Fireworms should not be picked up with bare hands as they can inflict painful injuries. They may be introduced accidentally, so be careful.

## ARTHROPODA (CHELICERATA, UNIRAMIA)

The Chelicerata include the spiders and the fascinating Horseshoe Crabs[8], *Limulus polyphemus*, of the western North Atlantic. They lack the antennae and antennules of the crustacea, and possess pincers or fangs, called chelicera[9]. Sea-spiders form a separate class called the Pycnogonida, found mainly in cold seas, with some, probably, ectoparasites of sea anemones.

The Uniramia contains the insects, of which only one species, the Water-skater, *Halobates*, found in the tropics, is fully marine. A few species of Springtails and Bristletails can be found on the upper shore.

## BRYOZOA (= POLYOZOA) (SEA-MATS)

Superficially, the Sea-mats are easily mistaken for the simpler Hydroids[10]. Some species, like the Hornwrack, *Flustra foliacea*, look like seaweed (it has even been given a colloquial name like the major group of Wrack Seaweeds). Most are encrusting species forming mats, and on British shores they are an important part of the web of life.

TOMASZ WALKOWSKI

Microscopic examination is often necessary to identify Bryozoa accurately.

The Common Sea-Mat, *Membranipora membranacea*, forms a lacework pattern over kelps and other seaweeds, and is a familiar sight to the rockpooler.

Microscopic identification is often necessary to separate the species which feature on the most interesting pieces of British living

rock, together with attached sponges and calcareous seaweed encrustacions.

The tropical aquarist is most likely to encounter Bryozoans in the same way, with interesting and surprising lumps of living material. They may appear as a pink rigid lattice-work pattern standing upright on a rock. These are not well-known animals, but may be very important on a coral reef, growing over dead coral like moss, especially in the shade.

Bryozoa are suspension feeders on plankton and detritus.

## UROCHORDATA (TUNICATES, ETC)

Tunicates or Ascidians are classified in the Chordata because the larval stage has evolved a primitive backbone, known as a *notochord*. The purse-shaped animals, with a leathery feel, metamorphose into a sessile animal, the Sea Squirt, when adult. These adults could be easily mistaken for a sponge, but note that all Sea Squirts have two openings: one to inhale water from which they extract food and oxygen, and the other to exhale the water and waste products. In small species this is not easily seen.

The colonial Star Ascidian, *Botryllus schlosseri*, appears like a series of stencils on the surface of a rock. The Light-Bulb Sea Squirt, *Clavelina lepadiformis*, is a temperate water example of one of many transparent species. Tropical species come in all colours, but because of their total lack of movement, they are rarely available in the shops. Reef species feed on live plankton, so keeping them for long periods may prove difficult.

## MINOR PHYLA

Of the seventeen remaining phyla with more than one living species, note that the Rhychocoela ( = Nemertea) contain the carnivorous Ribbon Worms, and the Lampshells, which look like molluscs, are classified in the Brachiopoda.

Plankton collectors will encounter the Chaetognatha. These Arrow Worms are elongated (about 2cm — 0.8in) predatory animals of the genus *Sagitta* that are indicative of major water divisions, e.g. oceanic or coastal. They feed on copepods[11].

## CONCLUSION

This article concludes the series on Invertebrate Zoology for the aquarist. I have only briefly introduced the phyla of animals. The articles are designed to be read in conjunction with a book on general marine keeping [12], and with specialised texts like:

*The Manual of Fish Health* — by Dr C Andrews, A Exell and Dr N Carrington. [**Salamander** 1988] — invertebrates as parasites.

*The Manual of Marine Invertebrates* — by M Haywood and S Wells [**Salamander** 1989].

For specific references and enquiries, please write to **Andy Horton, British Marine Life Study Society, c/o Aquarist & Pondkeeper.**

## Phyla of Metazoa (based largely on Barnes 1987)

The principal multi-cellular animals are divided into the following phyla:

SUB-KINGDOM: Parazoa

**PHYLUM**

Porifera ..... sponges

**SUB-KINGDOM:** Eumetazoa

**PHYLA**

Cnidaria[2] .....
- **MAJOR CLASSES**
- Hydrozoa ..... hydroids
- Scyphozoa ..... jellyfish
- Anthozoa ..... anemones, corals

Ctenophora ..... comb-jellies

Platyhelminthes .....
- Turbellaria ..... flatworms
- Monogenea ..... flukes
- Trematoda ..... flukes
- Cestoda ..... tapeworms

Nematoda ..... roundworms

Rotifera ..... microscopic 'wheel' animals

Mollusca[3] .....
- Polyplacophora ..... chitons
- Gastropoda ..... snails
- Bivalvia ..... twin-shelled molluscs
- Cephalopoda ..... squids, octopods

Annelida .....
- Polychaeta ..... marine worms
- Oligochaeta ..... earthworms
- Hirudinea ..... leeches

Arthropoda .....
- **SUB-PHYLA**
- Chelicerata ..... spiders, etc
- Crustacea[4] ..... crabs, etc
- Uniramia ..... insects, etc

Bryozoa ( = Polyozoa) ..... sea-mats

Echinodermata[5] ..... starfish, urchins, etc

Chordata .....
- Urochordata ..... tunicates, etc
- Vertebrata ..... animals with backbones

**MINOR PHYLA:** Mesozoa (small parasitic invertebrates), Rhynchocoela ( = Nemertean Worms), Gastrotricha (small group of marine and freshwater ciliated invertebrates), Nematomorpha (Hairworms), Acanthocephala (parasitic 'worms'), Kinorhyncha (small 'coastal' group of inverts which live on muddy bottoms), Sipuncula (Peanut Worms), Echiura (marine worms similar to the Peanut Worms), Pogonophora (deep-water 'worms' that lack a digestive tract), Tardigrada (Water Bears), Onychophora ('missing link' between true worms and arthropods), Pentastomida (Tongue Worms), Phoronida (small group of 'worms' which live in chitinous tubes), Entoprocta (small group of marine [with one exception] sessile, or fixed, inverts related to Bryozoans), Brachiopoda (Lampshells), Chaetognatha (Arrow Worms), Hemichordata (Acorn Worms).

## NOTES

[1] Small and extinct phyla omitted are: Placozoa, Loricifera, Archaeocyatha, Grapholothina.

[2] Cnidaria: Part 1 *A & P* November 1991; Part 2 February 1992.

[3] Mollusca: Part 1 *A & P* July 1991; Part 2 September 1991.

[4] Crustacea: Part 1 *A & P* July 1991; Part 2 September 1991.

[5] Echinodermata *A & P* July 1992.

[6] Metazoa: kingdom of multi-cellular animals.

[7] Zooxanthellae Cnidaria Part 2 *A & P* February 1992.

[8] Horseshoe Crabs by Dr Gareth Evans *A & P* September 1990.

[9] Chelicera — pronounced = *kuh-lis-er-a*

[10] Hydroids — sea-firs, class of cnidaria (medusa stage like jellyfish) Cnidaria Part 1 *A & P* November 1991.

[11] Copepoda — class of small crustaceans. Crustacea Part 2 *A & P* September 1991.

[12] *Interpet Encyclopedia of The Marine Aquarium* by Dick Mills [**Salamander** 1987] is one of many detailed guides for newcomers to the marine hobby.

## FURTHER READING:

*Invertebrate Zoology (5th edition)* by Robert D Barnes [**CBS College Publishing** 1987].

*Animals Without Backbones (3rd edition)* — R and M Buchsbaum, J and V Pearse. [**University of Chicago Press** 1987].

**British littoral fauna:**

*Students Guide to the Seashore* by J D and S Fish [**Hyman** 1990].

*'Glaucus'* journal of the **British Marine Life Study Society.** MLP

## OTHER ARTICLES IN THIS SERIES

**Part 1** — Introduction to the Major Phyla — May '91.

**Part 2** — Crustaceans: Crabs, Lobsters and Friends — July '91.

**Part 3** — Crustaceans: Moulting, Growth Cycle and Selected Forms — September '91.

**Part 4** — Cnidaria: Anemones, Jellyfish and Friends — November '91.

**Part 5** — Cnidaria: Corals and Anemones — February '92.

**Part 6** — Molluscs — April '92.

**Part 7** — Echinodermata: Sea Stars, Urchins and Cucumbers — July '92.

# Helping Hand

By Kevin Fox

Welcome friends (I think I've known you all for long enough now that I may use that word) to this month's helping of **Helping Hand.** Lots to get through again (honestly, so much accrues each week that this column could go weekly, never mind bi-monthly!) I'll start with the general items, clearing the underbrush for my main subject. Excuse me while I just get my shoe horn. . . .

The book launch went very well — well I thought that it did! — and today I've just come back from recording an interview for BBC Wales, who also gave it a really excellent plug.

On yes, just to show you how every cloud has a silver lining, I recently had a bad fall in which I sprained both wrists so badly that the **bandage factory** had to cut my wedding ring off. That's the first time it's been removed in fourteen years of marriage! I also broke my left ankle and cracked five ribs.

Anyway, you remember how my wife shifted my Mark 1 tank across the other side of the room etc. from the last column? Well, she took so much pity on my crawling across the carpet to watch my fishes that, in two days, my 'old' tank was back in position at the side of my chair, and within a fortnight, was fully functioning again! It was *almost* worth the pain (see photo)!!

## FISH OUT OF WATER

Which now begs a question (logical, isn't it?): exactly how long can a fish survive out of water? Having had my original aquarium restored back in its purpose-designed corner (easy wheelchair access, twin 13 amp wall sockets, and low enough for me to carry out routine maintenance), I was keeping some plants for the Test-Bench tanks 'A' and 'B', and also a set for my breeding/growing on aquarium. These plants were just left floating loosely on the top of the water.

Came the time to gather them, I opened my tank's hood and thought I heard a dull plopping sound. I immediately searched the local area but found nothing. Removing the extra plants from my main aquarium, taking them upstairs (even the stairlift takes two minutes to complete its journey) and taking my time to ensure that the planting was done 'according to the book', I then returned downstairs, cleaned the front glass of my main aquarium and finished off by polishing the glass with window cleaner, Scrim. This whole process, from originally lifting the lid to replacing the Scrim in the cupboard, took around half-an-hour.

Being now completely shattered, I flopped into my leather Queen Anne Chesterfield, ready to re-charge my batteries by watching my fish. A growing horror began to strike me: I had bought TWO Paradisefish (very luckily a male-female pair), but now I could only see the male half. I remembered the dull plopping sound when I first opened the tank and, in a frenzy of activity, I located the missing fish under my chair. When I located it, I wasn't too hopeful: it had already been out of the aquarium for 50 minutes. Using a scoop, I gently swept up the fish, and felt its body only to find it deadly cold. But then, a little twitch of the eye gave me the hope that maybe I could revive it.

I dropped it into my quarantine aquarium and slowly raised the temperature to 80°F (c 27°C), then arranged an air-pump and airstone so that the extra water temperature wouldn't deplete the water of too much oxygen. At first, there was absolutely nothing. The fish simply sat on the glass bottom of my quarantine tank.

By the way, my quarantine tank has no substrate, just a sheet of black cartridge paper on top of the polystyrene ceiling tiles which cover the bottom of the tank, and coloured gells which I use to control the colour of the light entering the aquarium. Inside the tank is a heater. Filtration entirely

KEVIN FOX

**The Paradisefish which came back from the dead.**

KEVIN FOX

**My 'old' tank . . . back in place and fully functional once again.**

depends on what I'm doing in the tank at that time.

After an hour, the fish started to make small swimming strokes, no more than a flutter of the caudal and pelvic fins, but a definite improvement. Well, to cut a long story short, it continued to recover so well that, despite being out of water for the best part of an hour, it has been saved, probably in every sense of the word, because it is enormously difficult to purchase a breeding pair. In this case that is exactly what we planned to do because, each day, my wife (Marie) becomes more and more interested in fishkeeping. She's already had success with Guppies, but now wants to try her hands at *Macropodus opercularis* — the common Paradisefish. And remember: Families which play together, STAY together!

## THE COMPETITION

Believe it or not, we still have around five times more prizes than we do entrants! And this at a time when people's minds are concentrated on competitions (Olympics etc). These goodies, and I do call a fully set-up 36in (90cm) tank, models 35 and 55 Hagen Biolife filters, two Whisper 2 external power box filters, electronic thermometers with memories etc, goodies (and that was a completely random dab into the goodies box) are keenly awaiting more entries from *A&P* readers. So, our editor and I have decided that we should open up the competition because I fully understand how reluctant many disabled people are to ascribe themselves the 'label' of *disabled*.

Therefore, in addition to the rules already explained in previous **HH**, here are some additional qualifying ones: don't worry about being confused, in the next astonishing episode of **HH** there will be a full run down of the rules etc, so keep tuned: it may win you hundreds of pounds worth of aquatic equipment.

The additional rules are: that **any** disabled person, whether or not they already have any equipment, can enter the competition. All they need to do is explain how they would set up a 36 x 18 x 12in (90 x 45 x 30cm) tank assuming that they won one: not forgetting to add a filter, heater/thermostat, hood and a light, as well as finishing it off with plants and fishes.

I am not 'forcing' you to declare a disability, although you may if you want. Further — to protect any personal information you want me to know of, but nobody else; the mail passes through the *A&P* offices *unopened*, and straight on to me. Therefore, the only two people who read your letter are the writer and me, *and no one else!*

When it comes to judging, I will make a summary for each entrant and give them a number (so even the judges won't know who you are). The judges will then select the winners and I will pass on the list of names and addresses to our phenomenal editor.

## DASH

Although I have mentioned the **Disablement Association, Hillingdon** in **HH** before, I make no apology for returning to the subject again, apart from it being a good warm-up to my other theme for this issue. DASH is a self-help organisation for and on behalf of the disabled populace of the area, but IS NOT restricted to the inhabitants of this London borough. They are fighting for equality with able-bodied people, such as campaigning for access to public buildings (I can't even get into my library!).

DASH offers a full advocacy service under Sections 1 and 2 of the 1986 Disablement Act. They produce a highly readable monthly *Newsletter* and an application form. The current one year's fee (January to December) for joining DASH as an individual, which also includes all of their services, is £3. For an organisation, such as a local Social Services Department, the St John Ambulance service, etc, it is £10.

Their address is: **DASH, Hillingdon Independent Living Centre, Royal Lane, Hillingdon, Middlesex UB8 3QW. Tel: 0895 31677.**

My membership is in the post already; where's yours? Expect tropical fishes to start appearing regularly any time now in their monthly magazine!

## THE INNER MAN (OR WOMAN)

Let's just take a step back from the daily pace of life and consider: why did we start keeping fishes in the first place? If, like me, your answer is because they make such a lovely three-dimensional display in which we play a major role in their upkeep, where we would stare for hours and hours, looking and wondering, then where did it all start to go wrong?

Once upon a time, feeding our fishes would take at least an hour as we watched each morsel being chased around the tank, taking special note of the fishes which ended up right at the back of the queue so that we could give them a little extra when the other fishes weren't looking.

Today, many aquarists seem to have no time for their fish. Sure, they feed them, clean the tanks and filters (when they remember) too, but this is often much later than the manufacturers recommend. In short, although they grudgingly spare the time for routine maintenance, they just do not seem to have the old ability to sit themselves down and look after the fishes.

Yes, I'm just as guilty, even though I'm presently running four-and-a half tanks, and can think of numerous 'extenuating circumstances' as well. I know that there are a great number of disabled aquarists who, despite the trauma of their injuries, or their learning to live with a life-threatening disease, put their trust in God and receive a 'spiritual reviving' which helps them through their daily lives. Equally, there are a number of us agnostics who have no god to provide the solace we seek.

So what have we got; a number of housebound people for whom time seems to hang heavily. Using myself as an example, I have to rest completely for two hours every day of the week (pernicious anaemia). I have a hyper-active brain which means that, although my body is relaxed, my brain just will not let go. I've tried everything other than what was staring me right in the face: my aquarium!

During the hours 18.00 to 20.00 Marie visits her family, my Number-One-Son is out playing and I have two hours of uninterrupted bliss. All I have to do is slip some Beethoven piano concertos, or Debussy onto the CD player, nudge my seat around slightly and that's it. I'm completely away.

Once again, I am enjoying leisurely feeding the fishes and watching their behaviour. Quite often, I'm so relaxed that I nod off altogether! Not for a moment am I advocating that you should follow suit, but once you stop watching your fishes, then it isn't usually long before you lose interest completely, and pack the hobby in, selling off your equipment, etc.

Not only that, it takes just the sight of one well-set-up aquarium before you're back at square one, looking around for a tank and driving your partner barmy, just as he/she's got used to not having all those strange bubbling noises and water everywhere. Recognise the signs of diminishing interest now, for the sooner these are spotted, the more quickly a 'cure' may be effected (such as joining a club), and things return to 'normal' (whatever that is).

So please bear that in mind now; everything you've done or accomplished so far has been to the benefit of your aquarium, to give it a better look, and to provide a more natural biosphere. Then, just as you've achieved all of this, you find yourself tipping a handful of feed into the tank, uncaring of whether it's eaten or not, slam the lid shut and dash off to work, remembering just in time to rush back and put the lights on.

Or, if you catch yourself thinking "It must be weeks since I last cleaned out the filter", then these are all danger signs that the end is nigh; from a peak, your interest has begun sliding downwards. Ignore things, and in a very short while, you will be an ex-fishkeeper. Give yourself over completely for at least an hour a day, and preferably more. Don't think of dates passed, keep a note of when things are due to be done, so that on the day, you will already have allotted time for the job.

What I do is this. I have my Test-Bench (two identical 18in — 45cm — tanks) my growing on/quarantine/hospital tank and my main aquarium. I have a detailed list of jobs to do on each tank and then have the sheets laminated in plastic, courtesy of my local FE college. Using those 'wipe on-/wipe off' pens, I simply tick off each job and mark the date when it was done (more of this in a later edition of **HH**).

There we go again, completely out of space, so I'll save the rest for the December edition of **HH**. Bye from me, and don't forget: watch and enjoy.

# Letters

JOHN DAVIS

**Singapore-bred Dragon Fish *(Scleropages formosus)* fry.**

## Singapore Dragon Fish Latest

We refer to your editorial in the June issue of *Aquarist & Pondkeeper* (Vol. 57, No. 3), entitled *CITES and the Dragon Fish*, and wish to thank you for highlighting the fact that Singapore has been successful in breeding the Dragon Fish.

It is indeed true that our farmers and the Primary Production Department have bred the fish over several generations since the 1980s. However, as Singapore only joined CITES in November 1986, we have not followed the requirements of CITES for registering the fish then. We are now doing that and hope to be able to apply soon to CITES to trade in the fish.

We hope this letter could be published in your next issue of Aquarist. Thank you.

**Leslie Cheong,**
**Head Aquaculture Branch,**
**Fisheries Division,**
**for Director of Primary Production Department,**
**Singapore.**

## Hampton Praise

We wish to congratulate all the companies who had aquatic stands at the Hampton Court Palace International Flower Show in July for setting such a high standard. It was also very fitting for the premier magazine you publish.

Our visit was well worth the three-hours-plus rail journey from Trowbridge to Hampton Court. It was also a great tribute to Chris Skilton, the show's aquatic consultant, for all his efforts. In 1993, the Aquatic Village would be greater still, with 24 stands!

**Bert Durling,**
**Trowbridge,**
**Wilts.**

[*Thank you for your kind comments, Bert. We have passed on your compliments to Chris Skilton as well. We are already all looking forward to Hampton '93. By the way, did you see our '92 report by Peter Purze in the September issue of A & P?* **Ed**]

## From One Newcomer to Another

I am a relative newcomer to the fascinating world of aquaria, my 36 x 15 x 15in tank having been purchased in November '91. I have read various books on the keeping of freshwater tropicals, but I find these very confusing, with all the scientific terminology and the conflicting information given by each author.

I set my tank up with gravel, a few smooth stones, well planted, u/g filter, 2 x 200 watt heaters, and aeration by means of a Whisper 300 pump. I didn't purchase any fish for three weeks and settled back waiting patiently, while my tank settled in.

I then sought help from my local aquarist shop on how to stock my tank. I was sold 1 Red Tail Shark (which is still alive and very content) 2 Sword tails, 2 Platies, 1 Fighter, 4 Tiger Barbs and 1 catfish.

I rushed home with my charges and floated the bags in the tank until the temperature had adjusted, then gradually let my fish out into their new home. To my horror, the next morning, all but the shark were dead. I rushed to my retailer for advice and was met with shrugged shoulders and told to try again.

This I did, but with another retailer who sold nothing but fish and equipment (no hamsters, kittens, guinea pigs, etc in sight). The helpful assistants took me through my new hobby step by step. I was then sold 10 Zebra Danios, 3 female Guppies, 1 male Guppy, 1 Sucking Loach, 5 Neon Tetras, and 5 Serpae.

My tank is now my pride and joy. My fish are happy and I have just had my first brood of Guppies, all of which are alive and growing rapidly.

The object of this letter is to get to anyone thinking of entering the world of this fascinating hobby. Please make sure you buy from a reputable dealer who knows what he or she is talking about and has the time to answer your queries (of which you will have many) but, above all, persevere and take the advice of your dealer. I assure you the disappointments are few, but the rewards are many.

Good luck and happy fishkeeping.

**Terence Moore,**
**Bolton,**
**Greater Manchester.**

## Historic Carp

I was interested to read about adaptable exotic species in the *Tomorrow's Aquarist* section of the July issue. Gina Sandford is right to highlight that the oldest and most successful exotic to be introduced into the UK is the carp, *Cyprinus carpio*, of which Koi represent the coloured variation.

Carp are an extremely interesting fish from the historical perspective. No other fish has such a well-documented history, and this is entirely due to its wonderful eating characteristics. To most fishkeepers' horror, the same would equally apply to Koi!

Gina has only touched on the historical introduction of carp into Britain and, in such a short space, cannot give justice to this magnificent fish. One point which should be clarified is the actual date of introduction and the reason why it was introduced.

Gina suggests, by implication, that the introduction occurred shortly before 1496, since the first well-known documentation of the fish was published in that year by Dame Juliana Berners writing in a book devoted to angling: "*... the carpe is a deyntous fish: but there ben but fewe in Englande. And therefore I wryte less of hym.*" The fact that Dame Juliana suggests that there were only a few carp in England at that time has led commentators such as Keith Banister to suggest that the actual introduction occurred around then.

Gina also suggested that carp were probably introduced into monastery ponds by the church as a food fish needed for the 100 or more abstinence days a year when the consumption of red meat was forbidden. However, the first actual records of carp and monastery ponds come only as late as 1531. William Moore, the Prior of Worcester from 1518 to 1536, managed several fishponds, recording the stocks in his journal. Most of the fish were obtained from local fishermen who supplied him with eels, tench, bream, roach and perch. The only mention Prior Moore makes of carp is a reference to a trial introduction of these fish during 1531, long after Dame Berners' book.

Gina also mentions the couplet from the chronicle of Sir Richard Baker:

*'Hops and Turkey, Carps and Beer*
*Came into England all in a year.'*

The mention of turkey dates this couplet after the discovery of America. However, a more contemporary version also exists:

*'Hops and Heresey, Carps and Beer*
*Came into England all in a year.'*

This refers to the dissolution of the monasteries in 1538 and the establishment of the Church of England. The refer-

ence to the merchandise indicates their release from monasterial control into that of land owners.

Many ruined monasteries and abbeys, now open to visitors, describe acres of land as that of carp ponds. However, it is likely that the church in England had little to do with the introduction and spread of carp, although, in continental Europe, the spread of carp can be directly linked to the spread of Christianity.

It is most probable that carp were actually introduced at least 100 years before the dissolution of the monasteries. No records exist, but it is likely that the introduction was a commercial decision. London fishmongers were already financing the construction and stocking of ponds to meet the increasing demand for fish. Additionally, merchants were increasingly travelling abroad and observing the management of fishponds on the continent.

It is not unnatural that attention should be turned towards making fishponds more profitable and efficient. The fact that carp were already being cultivated in Europe before this date, suggests that English merchants would be sufficiently motivated to improve their own pond productivity and go to the effort to transporting the fish across the Channel.

The first confirmed reference in England to carp so far uncovered, comes from Sir John Howard who refers to the fish in his list of expenses:

*"And in the seven year of the king, twenty-eight day of January (1467-68), I brake mine greatest pond in the park, and out of that I took in great breams, sixty five. And put them in to the mill pond, the which is new made; and I put the same day into the same pond six great carps; and the same day I put in to the same pond in little carps, twelve score. And in great tenches, the same time fourty three. In small tenches, twenty. In little breamets, sixty six. In roaches, thirteen score. In perches, six score. All these is at this hour and day in the mill pond."*

The most interesting point arising from this account is that carp were already well enough established by 1467, that Sir John Howard did not distinguish between them and the other native species mentioned.

Even as far back as 1467, carp were commercially important. Today, their ease of culture makes them the most widespread fish species in the world, with over 1 million tonnes farmed to provide an inexpensive source of fish protein.

**Dr Martin Jaffa,**
**Callander McDowell,**
**Failsworth,**
**Manchester.**

**Common Carp photographed by Laurence Perkins from a coloured lithograph by A. F. Lydon in Rev Houghton's *British Freshwater Fishes* (1879).**

## Unsafe Connections

On page 80 of the July '92 issue of *A & P*, the notes which appear under the photograph are, quite simply, 'dangerous'. The set-up shown is not at all safe. I therefore think that *A & P* readers should be made aware of this.

The idea that two plastic boxes provide a safe waterproof installation is crazy. There are, one could say, 1,001 reasons for not doing things this way.

All exterior wiring must be done in waterproof (IP rated) cable boxes with proper glands to prevent the ingress of water and moisture.

**Dave Lunn,**
**A-Tech Water Management Systems Ltd,**
**Aylesbury,**
**Bucks.**

**Dr Ford's home-made waterproof electrical fittings protector, as featured in the July article referred to by Dave Lunn.**

## David Ford Comments

Yes, all the electricity manuals do indeed stipulate sealed boxes for external mains connections. Being a scientist, though (rather than an electrician), I like to experiment.

My pond has commercial quality plugs and timers in sealed metal boxes. However, I found that, over the years, these failed because insects found their way through the best of glands to cause corrosion and even a short circuit. Therefore, the double plastic box idea was tried to protect these fittings . . . and it worked very well. They were then tried on transformers, timers and even domestic plugs and sockets.

Over three years of use, the electrical connections have remained clean and corrosion-free, since they are in their own waterproof (even storm- or flood-proof) 'indoor environment'. Also, insects are repelled by the plastic chemicals of the box and do not enter.

Nevertheless, I only advise competent DIY enthusiasts to install such fittings, hence the recommendation to consult a qualified electrician. Note also that a mains circuit breaker is considered essential.

There may, indeed, be 1,001 technical reasons for not using double plastic boxes, but, in practice, they work well.

The ideal set-up for any pond must be external quality fittings housed in the double plastic boxes (one upside down over the lower) wired via armoured cable to the mains via a circuit breaker.

**Dr David Ford**

# Tomorrow's Aquarist

By Gina Sandford

## AQUARIUM 'ORCHIDS'

At this time of year, people usually start to take more of an interest in their aquarium, which has been ticking over during the summer months. The tank is given an 'autumn clean' and spruced up to adorn the lounge, bedroom, hall or wherever it is that you happen to keep yours. Well, what about trying some different plants for your aquarium?

I think that one of my favourites is a south-east Asian plant called *Barclaya longifolia*, some times known as the Orchid Lily. It can prove very challenging to grow but, if conditions are right, it thrives and makes a beautiful specimen plant. Orchid Lilies are offered for sale as small rhizomes (underground stems) with a tiny rosette of delicate leaves. These should be planted in a nutrient-rich fairly fine substrate. The lighting needs to be bright but not too brilliant so, if your aquarium is very brightly lit, be sure to choose a shady place to plant your *Barclaya*. A water temperature of about 23-25°C (73-77°F) has proved to be suitable, and a gentle water current seems beneficial.

In good specimens, the long, narrow leaves can grow to 50cm (nearly 20in) in length but, more often than not, they are far less than this in the aquarium. Dark green above, a reddish underside, and wavy edges, they are extremely delicate and susceptible to damage from snails.

Well established plants will often flower. The flowers may open above the water or may remain submerged and closed; either way, seeds will be formed as the flowers are self-fertile. I usually leave the seeds to float around the tank until they develop into tiny plantlets. When large enough to handle, these can be planted in the substrate. I am reliably informed that the plant can also be propagated by runners, but I have never had runners form on any of my *Barclaya* plants.

So, next time you're down at your local shop looking for fish, why not give the plants a second glance and see what you can find?

Kent Sandford

**The Orchid Lily (centre foreground) can prove challenging but, once it gets going, it's a great plant for the aquarium.**

## CARP UPDATE . . . (or should it be: Backdate?)

Our Editor recently forwarded me a letter from **Dr Martin Jaffa**, who is also interested in the historical significance of Carp, and refers to the July **TA** (full text appears in the **Letters** pages). In it, he states that Carp were probably introduced about 100 years before the dissolution of the monasteries in 1538, and that the first confirmed reference to them in England comes from **Sir John Howard** who lists them in his expenses for the years 1467/68. This is some 30 years before the date I gave.

Another interesting point Martin makes is a reference to fish-farming London fishmongers of the day who used to finance the construction of ponds, while merchants travelled to Europe to look at fish farming there.

With this reliance on freshwater fish, and the good eating quality of Carp, I find it incredible that I cannot buy it over the counter at my local fishmongers. I can order it because it is available at the fish market but, with all the benefits of modern storage and transportation, our tastes today (in England, at least) have turned to sea fish as a prime source of food. The Carp has, therefore, been pushed to far recesses and overlooked, whereas, worldwide, it is farmed to provide an inexpensive source of fish protein.

## CHILEAN SURPRISE

There are days that are lousy, and days that are lousy! Well, today was just plain lousy! Having trekked down to do the shopping, fought my way round the supermarket, mislaid a panda (middle daughter's toy) and had to retrace my steps to retrieve it, the last thing I felt like when I got home was doing the ironing, or cleaning the filters in the fish house (the latter is still preferable to the former). Worse was the fact that tomorrow I had to do more shopping, although it could be combined with a visit to the local fish establishments, which would make it more bearable.

I put all the groceries away, switched on the kettle, went out to put the rabbits on the lawn (at last, it had stopped raining), came back, made a cup of tea and disappeared to drink it in peace in the study.

What did I find? A fax. Now, faxes are usually like phone calls: always bad news, but this time I was mistaken. Our editor had sent through a letter from **Carolina Jane Zagal Roberts** who lives in Santiago, Chile — that's on the west coast of South America, to save you getting out your Atlas.

Carolina, you brightened up my day! When I took on this task (not quite the right word, but I can't think of a better one at present) of writing **TA**, I was in two minds as to whether to do it and **John Dawes** (our editor) did quite a bit of persuading.

Well, the last few months have proved him right and me wrong. It's good to find that people are reading **TA** around the world and joining in by writing to us. I would like to thank Carolina for her comments. I'm really glad she enjoys the column.

She asked a favour: that I pass on a message to **Matt Bond** for a Happy Birthday on 15 October. Matt, she says you're "one special guy!"

ALL CORRESPONDENCE FOR **TA** SHOULD BE ADDRESSED TO:
GINA SANDFORD,
TOMORROW'S AQUARIST,
AQUARIST & PONDKEEPER,
9 TUFTON STREET,
ASHFORD,
KENT TN23 1QN.

# Paper Round

By Dr Ian Winfield

## YET ANOTHER JAPANESE IMPORT

Many pondkeepers will have seen specimens of the Fish Louse *Argulus* on some of their charges. In fact, there are three species of *Argulus* native to Britain, although only one species, *A. foliaceus*, is typically found on fish in ponds and lakes. However, **S K Rushton-Mellor** of The Natural History Museum in London has found that this situation has recently changed with the arrival of *Argulus japonicus* which, as its name suggests, was described originally from Japan, but is now established in many parts of the world.

In February 1990, *A. japonicus* was found established on Koi *(Cyprinus carpio)* from a private pond in Kent and Mirror Carp *(also Cyprinus carpio)* in Hereford. In April 1991, it was collected from Koi in a private pond in Hampshire and from native fish populations including Rudd *(Scardinius erythrophthalmus)*, Roach *(Rutilus rutilus)* and Common Carp *(Cyprinus carpio)* in Kent and Dorset.

Rushton-Mellor considered that a more detailed geographical investigation of ponds and lakes would reveal *A. japonicus* to be widely established around southern Britain. Unfortunately, such a survey would be no easy task because it is very difficult to differentiate between *A. japonicus* and the native *A. foliaceus;* the females are virtually indistinguishable and males can only be identified by the nature of the accessory copulatory structures on legs 2 to 4 (whatever they are!).

As is usually the case with species introductions, it is difficult to predict the future effects of this new parasite in British waters. If any pondkeepers do notice severe *Argulus* explosions on their fish, I would be interested to see a few specimens of the offending lice!

(**Source:** *Aquaculture and Fisheries Management* **23,** 269-271.)

## DEEP DIVING IN BELUGA WHALES

Very little is known about the diving behaviour of cetaceans, which is not surprising, given the logistical, financial and technological problems inherent in such studies. However, **A R Martin** of the Sea Mammal Research Unit, U.K., and **T G Smith** of the Department of Fisheries and Oceans, Canada, recently made a study of deep diving in wild, free-ranging Beluga Whales *(Delphinapterus leucas)* in the Canadian high Arctic.

Three adult female Beluga were captured by driving them into a shallow water and carefully restraining them with rubber-covered rope. A back-mounted electronic package comprising a UHF radio transmitter, a microprocessor, and pressure and emergence sensors was harnessed to each Beluga. Signals from the transmitters were received by polar-orbit satellites which allowed the position of the Beluga to be determined to an accuracy of better than 1km (0·62 mile) more than 20 times each day.

Three kinds of diving behaviour were observed:

(1) near-surface shallow dives,

(2) spike dives to between 20 and 150m (c65-490ft) depth, and

(3) prolonged, flat-bottomed dives to a maximum depth of 350m (c1,150ft).

RICK MILLER/NEW YORK ZOOLOGICAL SOCIETY

**Belugas — latest research shows that they are deep divers.**

The duration of these deep dives was between nine and almost 14 minutes, during which the whales descended at rates between 1.43 and 2.20m (4·69-7·2ft) per second and ascended at rates between 1.23 and 1.84 metres (4·04-6·04ft) per second. Such dives were usually to, or near to, the sea bed and were probably foraging dives.

Up to 42% of a Beluga's time could be spent at depths of 8m (c26ft) or more, where they would be invisible to any aeroplane- or ship-based counters. Martin and Smith concluded that future surveys should employ a correction factor for those Belugas out of sight when the counters passed them.

(**Source:** *Canadian Journal of Fisheries and Aquatic Sciences* **49,** 462-466.)

## APPRENTICE MECHANICS ON THE BEACH*

In the television series *The Trials of Life*, one of the most memorable pieces of footage was of Killer Whales *(Orcinus orca)* rushing out of the sea to catch seals resting in the apparent safety of the beach. Did you wonder how these magnificent predators learned to perform this pretty unlikely behaviour?

**Christophe Guinet** of the Centre National de la Recherche Scientifique in France, made a detailed study of such behaviour in the Killer Whales of the Crozet Archipelago in the southern Indian Ocean and found that this is another example of mother knows best!

Intentional stranding on the beach was performed principally by adult females to catch Elephant Seals *(Mirounga leonina)* on shore and during social play, during which times calves were in close proximity. In most cases, the young whales swam at the side of the female, slightly behind her head, and the two whales beached side by side.

The adult females were always observed returning to the water from the shore side of the calf, apparently helping to roll it back into the sea. Interestingly, the offspring of one female, which did not herself strand very often, was seen to beach with other females, apparently being taught the finer aspects of the art by its aunties.

* In case you are still wondering, professional assassins are known in the trade as mechanics (ask Charles Bronson!).

(**Source:** *Canadian Journal of Zoology* **69,** 2712-2716.)

## EVEN COD HAVE TO REMEMBER THE ANTIFREEZE

One of the great traditions of the onset of the British winter is the checking of antifreeze levels in car radiators up and down the country. Many species of sea fish take similar precautions by increasing the amounts of protein macromolecules in their blood plasma as their habitats start to fall to around, or even below, freezing point.

One such fish is the familiar North Atlantic Cod *(Gadus morhua)* and **Sally V Goddard, Ming H Kao** and **Garth L Fletcher** of the Marine Sciences Research Laboratory, Canada, have found that the pattern of antifreeze production in this species varies significantly in different age groups of fish.

Under aquarium conditions carefully controlled for temperature and light periods, juveniles developed increased levels of antifreeze macromolecules in the early winter, well before the onset of freezing temperatures, and subsequently had significantly higher levels than adults during the deep winter. Juveniles began to increase their antifreeze levels when the water temperature dropped to between 2 and 3°C (35·6-37·4°F), compared with between 0 and 1°C (32-33·8°F) for the adults.

Goddard and her colleagues suggest that these patterns of antifreeze production may be important for winter habitat selection, allowing juveniles to stray in sub-zero inshore waters while adults must migrate to the ice-free safety of deeper areas. This is a particularly valuable ability for the young Cod, given the cannibalistic tendencies of their elders.

(**Source:** *Canadian Journal of Fisheries and Aquatic Sciences* **49,** 516-522.)

# Seaview

By Gordon Kay

I know that I am sometimes taken to task about my views on Cetaceans (whales and dolphins) but I am afraid that this month's page is again about them (I don't give up easily!). So, I'll just give those of you who don't want to read this a second or two to turn the page. . . .

## BEACHED PILOTS

In July, the press were very busy reporting on fifty or so Pilot Whales which beached themselves at Seal Rocks, on the northern coast of New South Wales. Over two hundred volunteers worked through two nights to get the animals back into the sea and to safety.

A Navy helicopter tried to airlift several of the larger whales from the beach to the harbour 'holding' area — though this was abandoned when a specialist decided it would be too stressful — and four volunteers were treated for hypothermia, in a massive operation to save the beasts.

Sadly nine of the whales died, but the rest survived and were last seen about two miles out to sea, showing no sign of turning back. I thought it wonderful that so many people were happy to come together and join forces for the good of the whales. For the whales' part, it was lovely to see lots of people wading in the sea — surrounded by Pilot Whales — without the intent to kill them.

## BRIGHT RELEASE

On 19 July, the *Mail on Sunday* carried a full page feature on **Brightness** — the eight-year-old Beluga Whale. Brightness became famous when he escaped from a marine centre in the Crimean Port of Sebastopol and was captured off Turkey. Since then, he has been kept in a concrete pool in an oceanarium at Lapsi Bay, in the Ukraine, where he did the usual daily round of performing tricks.

The newspaper, along with a group of animal rescue experts, had obtained agreement from **Professor Lev Mukhametov** — the scientist in charge of Brightness — that the whale could be returned to the oceans and freedom, after nearly a lifetime in captivity. This will be the first time that a captured whale has been rehabilitated in this way.

Professor Mukhametov was quoted as saying that he had been shocked at the wave of emotion that the news of Brightness had created, and this was one of the factors in his decision; he had apparently received hundreds of letters from children appealing for the whale's release. He also said that the Russians would work with the British team, and that it would be "very interesting" to see the results.

The man behind the crusade to free Brightness was British diver **Ray Gravener,** co-founder of the British Divers' Marine Life Rescue Organisation. He was determined to see the whale returned to his natural waters, four thousand five hundred miles from the Crimea, and Ray and his partners — **Alan Knight** and **Mike Brett** — are hoping to teach him to fend for himself so that he can join a pod in the Okhotsk Sea, north of Japan.

Ray had asked for **Yegor,** Brightness' companion, to be released too, as he believed it would be easier to release them into the wild as a pair. Unfortunately, he has to be content with the release of Brightness alone.

It is thought that Brightness was trained by the Russians for use in secret naval operations — including laying and detecting underwater mines. The Russians, however, vehemently deny this. Detailed tests will be carried out to make sure that Brightness does not transmit viruses and infections into the wild.

It will cost two hundred and fifty thousand pounds to give Brightness his freedom and this will be raised through sponsorship and appeals. A large donation has already been made by an Italian magazine.

The lengthy retraining programme has already started, but Brightness will not be moved to his release site until next May — after the winter thaw in Siberia. It is hoped that this magnificent animal will be back in the ocean next autumn.

If you wish to help with a contribution, then call in at any branch of **National Westminster Bank** quoting **Account Number 59823143, Sort Code 60-06-11.** Cheques should be made payable to **"The Beluga Rescue Appeal".** Thank You!

## WHALE ON A PLATE

Still on the subject of whales in the press, according to the *Sunday Express* on 26 July, it had come to light that whales that were caught by Norway for "scientific research" were actually ending up on the plates of Government Officials and Civil Servants!

You will remember that Norway had announced that it would resume whale hunting next year, at the IWC meeting in Glasgow a few months ago. It had said that there would be a number of Minke Whales caught for scientific research this year. Norwegian sources confirmed that the country is allowing one hundred and fifty tonnes of whale meat from the current catch of one hundred and ten Minke Whales to be sold in shops for the domestic market.

Conservationists believe that Norway's renewed hunting could unleash another wave of whale slaughter in Japan. Some groups have called for a worldwide boycott on Norwegian goods to try to force them to abandon whaling and the Greenpeace ship, Solo, was shadowing six Norwegian whalers already engaged in this year's hunt.

The backlash against Norway is enormous. The Government has had to hire a firm of professional lobbyists to fight their case in the States, and there is even unrest in Norway, where some people see eating whale meat as rather like eating a pet dog.

Scientists in Norway reckon that there are now between eighty and ninety thousand Minke Whales around, which is enough to justify resumption of commercial whaling. I say that there can be no justification whatever.

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

### CAPTIVE CETACEA

In **'Gordon Kay Replies'**, in the August 1992 edition of *Aquarist & Pondkeeper*, I set out to reply, as lucidly as I could, to accusations that I was reproducing "any information sent to me . . . without trying to check if the facts are correct". I was attempting to make the point that I am — primarily — a reporter and commentator expressing my own personal opinions. I therefore still stand by my views on captive Cetacea.

However, on reflection, I can now see how **Drs Margaret Klinowska** and **Susan Brown** could feel that their reputation and integrity had been called into question. This, of course, was not my intention and I therefore retract completely any reference to Drs Klinowska and Brown, and offer my heartfelt apologies.

# OUT AND ABOUT

## WATERWORLD CENTRE

**By Dick Mills**

*Photographs by the author*

Do you answer to the following qualifications: interested in fish?; motoring (if you're lucky) around the M25?; bored?; like to see an excellent variety of fishes and all equipment without extending your journey by more than one mile? If the answers to all these are 'yes' then the place for you is just south of the M25 on the A10 (Junction 25). Turn right at the first set of traffic lights, then *immediately* right again (a matter of yards) into **Waterworld and Pet Centre.**

The last time I was there it was pretty impressive, particularly in respect of all-round choice of species — tropical, coldwater or marine — all housed in a two-block area. Today, this has expanded into five indoor areas with two more outside display areas. The original tropical and coldwater sections are still there (only just, for Manager **Jimmy Croft** told me that there are 'plans' for the coldwater section later this year), but added onto these are a pond equipment and aquarium room, a small animals and Pet Centre, and a Pond Centre. The Pond Centre is covered by a semi-circular tunnel of weatherproof material coloured in white and green stripes, which has the effect of making for a light airy display and yet, cutting out, say, 50% of the sunlight which would make temperatures a little unbearable in summer. This arrangement appears to work wonders, for the pond and marginal plants appeared to be positively flourishing under these conditions and the customers weren't wilting either; even in the most dismal weather, conditions in the tunnel would be quite acceptable under which to view the excellent stock of pond liners, preformed ponds and all associated decorative statuary. Leading off from the rear of this area is an outside display of waterlilies; each plant is clearly displayed and marked with variety name and growing characteristics. Other pond equipment, such as external filters, together with cabinet aquariums, can be seen in the adjoining room.


**Need pond accessories? Plenty to choose from, in well-laid out areas, plus plants outside too.**

Even if *you're* interested in fish, it doesn't always follow that the rest of the family is so inclined, so the Pet Centre is the best place to park them while you carry on to the rest of the fish-carrying displays. Parrots, monkeys, cagebirds and rabbits were well to the fore, with a good dry goods display to back them up.

The tropical fish area was just as I had remembered it, well-laid out, clearly-labelled, spotless tanks, but where was the fantastic display of marines I was expecting to see in the very large tank? The tank was still there with brilliantly-coloured fish all right, but these were freshwater *African Cichlids*, not coral reef dwellers. Times are hard, with a reduction both in demand and in the availability of supply, especially of corals (conservation measures beginning to bite?). However, there are half a dozen tanks containing marines. One I particularly noticed was being filtered by one of the new Hagen Bio-Filters. The 100 plus tropical tanks appeared to be bursting with fish, many of which were UK bred, either by individuals or commercially-based centres. A fully-centralised filtration system is used, backed up by undergravel filters in each tank. A centrally-placed cascade plant display is equally impressive. 'Front of house' in this section is the dry goods area; again, every conceivable device is there.

One end of the coldwater area is dominated by an oriental scene painted above a Koi pool; additional holding bays run along the wall of the 'Koi half'; the remainder is given over to Fancy Goldfish (some excellent Chinese imports) and native fishes; a high protective hoarding only permits viewers of adult height to see the 10lb-plus carp cruising around their enclosed pond.

Outside, there is a good selection of alpines and heathers, ideal companions for the poolside decor — a wide choice of suitable rockwork is nearby to facilitate instant rockery design. Incidentally, a pond design and installation service is also included among the staff's many obvious aquatic talents.

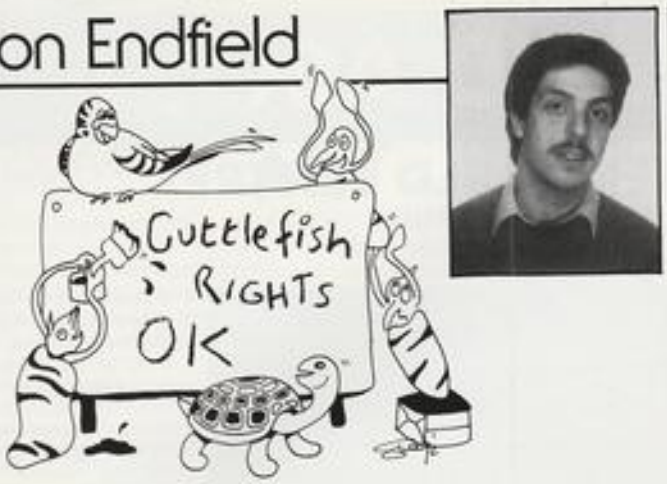
**Koi area. This large scene-setting mural overlooks the large Koi in their pool.**

**The tropical area has lots of spotless tanks, plus central aquatic plant display units.**

There's a lot to see, all under cover, whatever your own particular fishkeeping tastes, but I wouldn't chance walking down from a traffic jam to grab a quick look — even M25 jams don't last as long as you'll want to spend at Waterworld.

**Waterworld and Pet Centre** is open 7 days a week, 9 am-6 pm, and can be found at **Bullsmoor Lane, Enfield, Middlesex. Tel: 0992 761587.**

Jason Endfield






# A BONE TO PICK

What on earth could tortoises and cuttlebone have in common? The answer . . . **Jason Endfield!** Read on . . .

Somebody came up to me once when I was minding my own business and standing outside a shop, and asked me if I knew of anyone who had mislaid a tortoise, because he had just seen one — a large one — walking down a nearby street. I wondered whether he was having me on — after all, tortoise sightings in the high street are not exactly commonplace, and why hadn't he picked the tortoise up? But being the courteous, helpful citizen that I am, I gave him the benefit of the doubt and informed him that I was not aware of anyone having lost a tortoise, whereupon the gentleman sighed deeply, shrugged his shoulders and departed with a resigned look upon his face.

I'd have thought little more of this matter, had not a second fellow approached me just minutes later sporting an expression that told me all was not well in his world. This time, I was asked if I had sighted a large tortoise, as he had lost one from his garden. I must have the sort of face that invites strangers to ask me questions. I couldn't resist a little nervous smile just in case I was on 'candid camera' — golly, when I think about it now, I even waved at an imaginary camera in a nearby tree . . . how embarrassing. . . .

Needless to say, I wasn't under the illusion of being on tele for long — my response resulted in a less than friendly reaction from the tortoise's owner who gave an indignant grunt and seemed to grow in stature instantly to the size of a world champion weightlifter.

"Erm, try that-a-way," I said, pointing after the first gentleman (the one who had seen the tortoise) and I watched the second man run off down the street, into the distance and out of sight.

That was the last I saw of either of them. The tortoise had probably gone the other way . . .

Interesting how a tortoise could have two people running around like that, but then, these days, tortoises are quite a valuable commodity. Ever since the ban on the importation of European tortoises as pets in the early 1980's, the surviving British examples are cherished, and we have a situation that has to be better all round. The above-mentioned ban followed years of campaigning by animal lovers across the country — but the result was slow in coming, and very many tortoises had to suffer the terrible sea journeys to our shores from the Mediterranean lands, usually transported in awful conditions under which a high proportion cherished. But the campaigning did work and public pressure brought about the ban.

Allow me to quote from one typical report calling for action:

*". . . the shipments of these creatures showed a slight increase over those of the preceeding year. There were thirteen barrels, containing about 3000 tortoises . . . as might be expected, many of them frequently die on the voyage, and should a barrel become offensive, its contents are thrown overboard . . . public attention has been called to this cruel traffic in London, casks of tortoises having been found, lying unclaimed at the docks, with many of the inmates dead and in a putrid condition. It is a very unsatisfactory trade . . . involving an immense amount of cruelty to numbers of helpless and harmless animals . . . it is hoped that the (Mogadore) Consul's denunciation of this trade, supported by public opinion, will be the means of putting an end to this traffic . . ."*

Strong stuff isn't it? No wonder it worked! But it might come as a shock to you when I tell you that this call for a banning of tortoise imports is from a magazine of *1882**. It took us over one hundred years to respond to the plight of the tortoise. Scandalous. Now, perhaps half a million tortoises later, it is accomplished; the question has to be: at what cost? Surely even a healthy population would suffer enormously with such over exploitation.

Tortoises apart, one must ask whether our hobby is responsible for much trade in 'endangered' species — it's a much debated question and one that I cannot fully cover here, but whatever the answer, we must not rest complacently on our laurels. One example I will cite is one that has worried me for some time.

It concerns a trade that has continued quietly for years right under our noses. It is the business of cuttlefish, that mollusc relative of the octopus and squid (themselves exploited). The cuttlefish bone is sold as a source of calcium for cage birds; it is a generally accepted practice to purchase a 'bone' (the internal shell of the cuttlefish) at regular intervals — many thousands, perhaps millions, of birdkeepers aid the trade in cuttlefish, with little thought of the possible consequences.

Following a recent visit to a Chinese supermarket, and on seeing the wonderful array of exotic fish on sale, I am compelled to realise that large numbers of folk do, in fact, eat cuttlefish; it is therefore likely that cuttlefish are harvested in large numbers primarily for human consumption and we can perhaps presume that cuttlefish bone largely originates from this source, though, as always, figures are hard to establish.

What is certain is that cuttlefish are by all accounts one of the most fascinating and highly developed species of marine life; even if only a few are harvested for the pet bird market alone, then to me it seems slightly 'sick' to abuse them in this way when some sort of substitute must surely be available (chalk?).

We know through experience that natural populations of all species are fragile and that every species will suffer from over-exploitation; who can guess how long it will be before cuttlefish might join the ever-growing list of endangered animals. It would be disgraceful if the pet budgie market had any part in such an exercise even merely by association; feeding humans is one thing, pleasing budgies is quite another. We need to 'manage' the trade in nature with extreme care — lest we lose even more of our precious wildlife forever.

Meanwhile, we must be grateful for small mercies. Though it took over a century, we have seen the end of the tortoise trade. Tortoises can breathe a sigh of relief; well, all except one that is, the one that was last seen walking in a southerly, homeward-bound direction pursued by two men and, no doubt, wondering when humans will finally leave it alone.

* *The Leisure Hour Magazine*, 1882 **A&P**

# 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

## PLANTS

### SILVER DOLLAR PLANTS

*I have four Silver Dollars in my community tank. I've recently introduced some plants but these have been quickly eaten by the fish.*

*Can you therefore suggest any species that will survive in the presence of Silver Dollars?*

Silver Dollars (*Metynnis* species) are herbivorous by nature and so, it is not normal to keep them in planted aquaria.

However, you could try *Anubias* species, *Acorus* species, *Ophiopogon* species, *Cryptocoryne pontederifolia* and *Lagenandra* species. All these have very tough leaves and will probably not be attacked.

RUDA ZUKAL

**The Umbrella Plant *(Ophiopogon)* is a tough species which, while not being truly aquatic, nevertheless survives very well in aquaria and can probably withstand the attentions of plant-eating species such as Silver Dollars.**

Try giving your fish a little lettuce, spinach and duckweed to supplement their diet.

### NITRATE REMOVER

*I plan to build a pool measuring about 14 x 6 x 5ft (4.3 x 1.8 x 1.5m) with a trough about 9in wide (c 23cm) surrounding it. This trough will receive water via a small waterfall. After passing through the trough, this water will go down through a UV unit and then, finally, back to the main pool itself.*

*I would like to use a plant in the trough to remove nitrates from the water. What species would you recommend?*

The best plant for your purpose is *Sagittaria playphylla*. Growth is rapid and the plant produces numerous runners.

Nitrates are constantly absorbed and end up in the tissue of the plant. At the end of the season, remove all the dead foliage.

Sagittarias produce storage tubers in which the nitrogen is locked up and is used the following season to provide energy for initial growth.

## COLDWATER

### WEATHER LOACH SELECTION

*I have recently bought a Weather Loach and would like some information on it. I'd also welcome details of one or two other species of loaches which I could keep in a coldwater aquarium.*

Weather Loaches, *Misgurnus fossilis*, have been kept and enjoyed by aquarists for a very long time. They are interesting subjects because they can breathe air; also in their favour is that they are hardy, and so are easy to keep.

These fish can reach a length of 35cm (c 14in) and have five pairs of whiskery barbels, the smallest on the lower lip.

They prefer still, muddy waters, shallow ponds and swamps. As you can imagine, some of these stretches of waters are muddy, even stagnant, so in order to survive, they gulp air from the surface, swallowing it into the gut. Weather Loaches are found throughout eastern and central Europe.

Weather Loach is a name also given to *Misgurnus anguillicaudatus* which originates from Asia. This species is sensitive to barometric changes which causes it to gulp air at the surface, due to an imbalance in its swim bladder arrangement. It appears to 'dance' in midwater due to changes in air pressure.

Feeding is usually done at the bottom of the tank, picking up food from nooks and crannies between the gravel. Favourite foods are, worms, insect larvae and snails, but they will, of course, also accept flake and other forms of prepared foods if it sinks.

BILLY WHITESIDE

**The European Weather Loach *(Misgurnus fossilis)* is a hardy fish that does well in coldwater set-ups.**

The Spined Loach, *Cobitis taenia*, is also able to survive in stagnant ponds and ditches because of its ability to gulp air. It has spines under the eyes which must help to protect it from predators. This is quite a rare fish found only in the east Midlands and East Anglia.

A Loach which lives in better conditions is the Stone Loach, *Noemacheilus barbatulus*, which can be found in many parts of our country in rivers where the water is clean and clear. It is a small fish which is short-lived. Its spawning time is between April and June; fish then mature at about one year old.

All these fish do like hiding places, so your tank should have rocks and plants where they can spend the day.

# TROPICAL

## BEEFING ABOUT DIET

*My friends use beef heart to feed their fish, but I believe that fish can't digest mammalian fats. Would you please tell me if I'm being silly? I would also welcome some information regarding what effect this diet would have on fish if they are fed it continuously.*

Fish can digest some mammalian fat, but not in the high quantities found in many processed foods such as hams, burgers and sausages. The main danger to the fish is that the fat sets solid in their gut, causing blockages. This is because even 'tropical' fishes are at a much lower body temperature than the mammals such fat comes from. This is why fish store their fat as oils (think of Cod Liver Oil or oily fish like sardines).

Low fat meats are readily digested, such as ox hearts, liver, kidney and the very best steak. Any fat adhering to the meats *must* be trimmed off, though.

Note also that mammalian meats, although high in digestible protein, are low in vitamins and minerals, so an exclusive diet of such foods is bad for the fish. Always use a good commercial brand of fish foods which will contain vital trace elements, using meats as just titbits or treats.

## PTERY, HYPO . . . OR PLECO?

*On a recent visit to two shops, I was fascinated by their 'Plecos'. At both shops I was told that the fish were* Hypostomus plecostomus, *but, as I looked more closely, I counted twelve dorsal fin rays, instead of seven. Doesn't this make the fish* Pterygoplichthys?

You were quite right, *Pterygolichthys* (usually *multiradiatus*) is often confused with *Hypostomus punctatus*. Both are armoured South American Catfish of similar markings.

The 7 versus 12 fin rays are the main identifying characters which any true catfish expert will know. However, the average fishkeeper or retailer may well be confused, since *Pterygoplichthys multiradiatus* is also known as *Hypostomus multiradiatus* . . . but for that matter, *Hypostomus punctatus* was, until recently, *Plecostomus punctatus* (hence its common name). *Pterygoplichthys multiradiatus* was also sold under the name *Ancistrus multiradiatus* until recently! The 'Pleco' still remains the most common catfish in the trade because *Pterygoplichthys* will outgrow most aquaria (it reaches some 50cm — c 20in — against a Pleco's approximate 30cm — 12in).

JOHN DAWES

**A quick count of the dorsal rays of this magnificent fish (photographed at Kingfisheries) will show that it is most definitely a *Pterygoplichthys*.**

# KOI

## BIO-FILTERS/UV PLANT DAMAGE

① *My Koi pool has a three-part filter, the last chamber being reserved for biological filtration. I would like to cover this section this coming winter (to prevent freezing). Is this a good idea?*

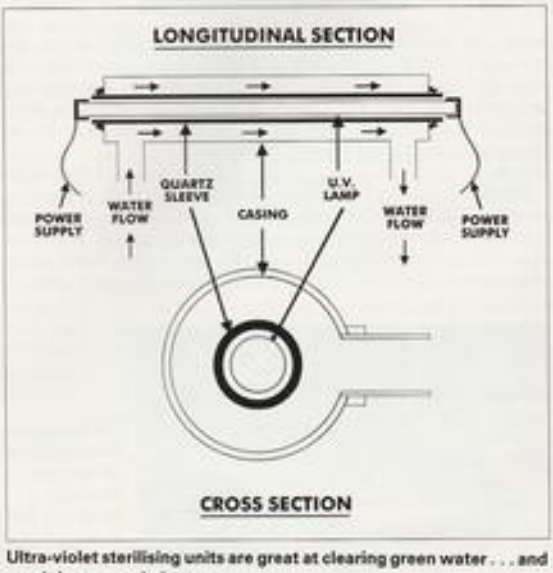
② *After water passes through the filter, it goes through a UV unit to clear it from free-floating algae. It does this very well, but will UV damage my other plants?*

In reply to your question regarding the covering of your filter to prevent freezing, it is quite in order to do so as, during the winter months, bacteriological activity is greatly reduced. In any case, the bacteria do not require light in order to flourish, their greatest requirement being a plentiful supply of oxygen.

Therefore, during the summer months, it is advisable to cover the tanks with a material such as garden shading which will reduce the amount of light (and will thus help prevent algal growth) but will still permit plenty of oxygen at the water/air interface.

Your second question is very easily answered. Your UV will have absolutely no ill effects on the plant life in your pool, as the UV rays only act upon living organisms as they pass through the field of UV light.

As you say that your UV is successfully clearing any green water, this comment might be superfluous, but it is normal practice to site the UV before the filter so that the dead organic material is trapped at the pre-filtering stage. Just a thought.




**Ultra-violet sterilising units are great at clearing green water . . . and won't harm pond plants.**

# What's your opinion?

By Billy Whiteside, BA, ACP

## U/G FILTERS et al

**Jack Penley-Martin** lives at Little Bishops, The Street, Hepworth, Diss, Norfolk, and writes: ". . . I am a firm believer in undergravel filtration — which probably says a great deal about my age! I can remember when U/G filters first became generally available to the amateur fishkeeper in the late fifties. One selling point was an improvement in plant growth due to the elimination of stagnant areas of gravel and the provision of nutrients at the roots. As a keen gardener, I am always striving to maintain an open compost for similar reasons, so it made sense. My plants seemed to agree and I developed a thriving trade in Cryptocorynes which hitherto had not prospered.

"However, nowadays we are told that aquatic plants take the bulk of their nutrients via the leaves, and roots, used primarily for anchorage, resent the flow of oxygen-rich water. Unfortunately, a wide cross-section of my plants appear to have read these articles and fade away. So, why do I persevere with the system?

"First, the gravel forms a large and efficient filter bed — and it is free, since most of us cover the base of our tanks. Second, I am not convinced that modern filters are as efficient as it is claimed. Theoretically, the inserts offer a massive surface area for bacteria; but whether, in practice, all surfaces are colonised, or whether there is an adequate flow through all parts of the medium, is another matter. Third, my filter medium soon acquires a surface-coating, so I doubt that it is effective. This also means that I cannot rinse it gently in water from the tank: it needs a thorough cleaning, so I lose what bacteria I had. So it seems sensible to use the substrate as a biological filter, with the power filter acting mechanically. In order to prevent clogging of the filter bed, I use a home-made form of reverse flow.

"My own hypothesis about the adverse effect of U/G filters on plant growth is that the modern power filter is too efficient. There is a rapid flow through the bed, whereas the little air pumps used thirty years ago probably created no stronger substrate currents than those generated by present-day heating cables. I have tried to overcome the flow problems in my latest tank by using a U/G filter smaller than the tank base and setting the plants in the unfiltered area. I have yet to detect any improvement in growth!

## OLD IS BEST . . .?

"I must confess to a wry smile when I read your little anecdotes about your Stone-Age tanks. My wife often asks why I continually fuss about my hi-tec-equipped set-up — trying a new type of fluorescent tube, cleaning filters, water changing, etc; yet nothing grows better or looks fitter than it did over thirty years ago when the iron-framed, puttied glass tank on the sideboard was crammed with plants and young Guppies, Mollies, Platies and Swordtails from the females gracing the display tanks. And all ran quite happily with home-made lids, domestic light bulbs, little SS or Montrose air pumps, UNO heaters and separate thermostats; no water changes because it had to be aged water!

"I find it very hard to give her a satisfactory answer though, to be honest, I could say that I never spawned Angels then, nor had I seen a Discus, whereas now I have one in the community tank. On the other hand, I have given up keeping livebearers since they need more fussing than Koi and the Swords and Mollies, especially, are a puny lot.

"These old tanks were easy to maintain because they had such good access: lift off the lid and all was revealed. The same holds true for *some* of the modern tanks, except that the hoods are not designed for casual removal; something, somewhere, is always hooked in on a short piece of wire!

"My general tanks are from a top-class manufacturer and I have no complaints about quality. There is also a purpose-built hood which has a compartment for the ballast unit at the back. It is isolated from the front part which earns full marks for electrical safety, but means that the rear quarter of the tank receives little light so that the plants grow towards the light. Also, it is very difficult to catch fish in that area and general access is confined to three-quarters of the tank. The lid does not lift off easily due to the unbalanced weight of the starter unit. The unit cannot be lifted out and put down beforehand as the tube leads are not long enough. I could give other examples, but this is typical and will suffice.

"However, what I miss most from those days is the sense of wonder. Now all is so routine: organised and publicised expeditions, local collectors, breeders in Hong Kong and masses of books filled with coloured photographs. Not that I object to seeing a wide variety of fish at reasonable prices in my local shop — and, even now, a careful scrutiny can reveal the odd unknown species. I have at least five unidentified *Corydoras* species; but, in the mid-fifties, our local pet shops had little other than the common livebearers and there was no mail order — although Paramount Fisheries of London operated a 'train order'. About twice a year I would journey up to town to see exotic species hitherto no more than photographs in McInerney. For the rest of the time, I would post an order midweek; the shop would put the fish on rail about 9 am Saturday and I collected the fish by noon. No Red Star or any special service — just routine!

"In the main we bought from private dealers with a few tanks in a shed or spare room. There was quite a lot of bartering and, occasionally, something new would appear. I can still remember paying £15 — almost the average weekly wage — each for a couple of Red-Tailed Sharks, the first in the area. Each new species would be compared with the nearest in McInerney so that we could set up the approximate conditions — and then we were on our own. It all seems very primitive now — but it was fun!"

## GUPPIES v HUMAN REMAINS

I enjoyed reading Jack Penley-Martin's letter because it reminded me of my early years in fishkeeping. I actually bought a pair of Guppies by post, from England, on several occasions, and the fish were posted to me in Belfast. I don't think there was even first or second class post in those days — just post! Anyway, I only placed orders in summer and I never lost a fish. I also used to love to send for snails and plants by post.

More recently, my friend **Ron Baldry,** of the Isle of Dogs, kindly sent me some Guppies by air. He delivered them to the cargo depot at Heathrow, and I collected them at the cargo depot at Belfast Airport when Ron phoned me to say when the plane should land. I went to collect my Guppies and an official asked me if they were in a large crate, pointing at one such crate. I read the label that said: 'Human Remains', and then realised that the official did not know what Guppies were. My carton of Guppies was rather smaller than that containing the human remains. . . .

## ALGAL POSER

I think I may have discovered why some species of fish have not been too happy on occasions in one of my large tanks in a bedroom. The tank is situated beside a sunny window and, to hide the power filter from view, I set it on the windowsill behind the curtain. The two tubes from the filter could then be snaked from the edge of the curtain to the top of the tank inconspicuously. The filter body and thick tubes are dark green in colour, so it's difficult to see what's going on inside.

However, the well-lit and, presumably, well-fertilised gravel, filter wool, filter sides and tubes seem to be supporting a thriving colony of dark-green algae. I wonder if the algae are manufacturing some sort of toxin that is pumped into the tank when the filter is switched on — at irregular intervals in my case.

I've decided to leave the filter off for two weeks to see if anything changes — other than the fact that the tank may get dirtier. I shall, meantime, clean out the filter and its tubes. Has anyone else had problems with algae growing in filtration systems? If so, please drop me a few lines.

## DISCO GLASSFISH

Photograph One of the accompanying photographs shows a pair of Clown Loaches — one of my favourite species, although perhaps not the easiest fish to keep. Photograph Two shows a lovely red male Dwarf Gourami — one of a pair that I bought recently. The female is quite dull, but the male is a really beautiful colour.

I was somewhat disgusted by another tank of fish that I saw recently in a large store. A tank labelled Disco Glassfish appeared to contain Glassfish that seemed to have had their backbone dyed fluorescent red, blue, green or yellow with some sort of dye. Needless to say, I did not buy any. I presume someone has perfected a method of getting the dye to dye the fishes' spine. There are plenty of colourful fish in dealers' tanks without the necessity to dye any artificially. A Glassfish is interesting as Nature designed it: it does not, need to be decorated. What is your opinion? I like dyed fish as much as I like dyed flowers!

## BIOLOGICAL ADAPTATION

**Alan O'Brien** is a regular contributor to this column and his latest letter "... concerns difficulties I have been having with an external power filter. The filter seems to drag in air intermittently through the body to discharge it via the spray-bar into the aquarium. This results in fizzy water which seems to scare the hell out of the fish, and, of course, can cause gas-bubble disease. Replacing 'O' rings only temporarily stops the trouble as these are subject to compression set with time — a kind of water wear. My solution to the problem was to cover the spraybar with a cylindrical foam filter cartridge. This does not reduce the filter flow, but entraps 95% of the air blown through it by the filter.

"The foam also becomes a home for nitrifying bacteria and thus assists biological filtration — providing it's at water level. If your aquarium is not at eye level like mine, then you cannot even see the foam. If it is seen, it could be hidden by rocks, plants, etc."

BILLY WHITLOCK

**Photo 1 (see text).**

BILLY WHITLOCK

**Photo 2 (see text).**

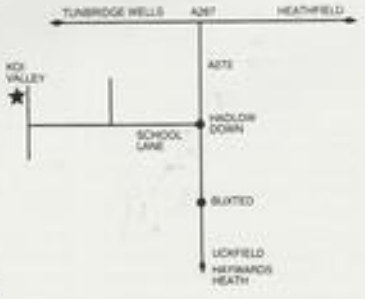
## FUTURE TOPICS

That's about all the space used up this month.

For next time I'd be pleased to receive a few lines from you giving readers your opinion on any of the following topics: (a) fish shows; (b) non-flake fish foods; (c) feeding aquarium plants; (d) breeding large cichlids; (e) filtration in marine aquaria; (f) cultivating marine algae; (g) feeding Koi; (h) preparing the garden pond for winter; and (i) breeding Tetras.

I hope you'll write to me c/o ***A & P***, **9 Tufton Street, Ashford, Kent TN23 1QN.**





# OUT AND ABOUT

## FLORIADE '92

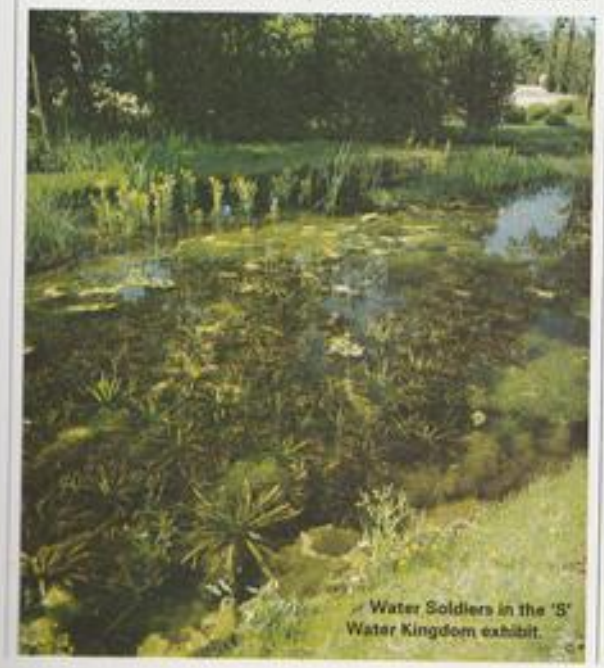
By David Allison

*Photographs by the author*

The Thai pavilion.

Part of the pool within the Japanese display.

To the 'normal' gardener, a visit to Holland usually means bulbs — mainly tulips. To the aquarist, any visit is bound to take in the public aquaria and some of the great aquatic shops, to compare prices, see different species and, perhaps (with an appropriate import licence), bring back some of those delightful fish which we just can't seem to be able to



Water Soldiers in the 'S' Water Kingdom exhibit.

One of the numerous free-standing trough water features at Floriade '92.

An attractively laid out small pool, complete with submerged aquatics, marginals and surrounding terrestrial plants.

obtain over here in the UK.

This year, there has been an added aquatic attraction in Holland — a feast for both 'normal' and 'aquatic' gardeners. Floriade — due to close at the end of this month — is only staged every ten years, and 1992 is seeing what appears to be the largest and most spectacular event of its kind held so far.

Floriade '92 is being held at Zoetermeer, about 12km east of Den Haag (The Hague), on a 68-hectare site divided into seven main areas: Trade, Transport and Distribution; Production and Energy; Consumer; Environment; Future and Science; World; and Recreation. Within these areas, the 185-day display of plants and gardens spans three seasons, so some keen water gardeners (and other enthusiasts) have made three separate visits over the duration of the event.

## Aquatic Exhibits

The section of the exhibition which is most directly relevant to aquarists and pondkeepers/water gardeners is the World area. In particular, the Thailand and Japan exhibits are well worth visiting.

The Thai pavilion consists of a traditional house built on a small mound. It's so good I could quite happily live in it during the summer months! Beside the house is a pond with a typical Thai bridge and boat. Sitting on the bank, I was easily transported into dreams of the tropics. Behind the house is a small orchard and greenhouse with traditional food crops.

If you visit this exhibit, look closely at the large stretch of water forming the letter 'S'. This 'Water Kingdom' contains well over 20,000 aquatic and bog plants, produced by the Aquatic Plant Growers Culture Group of the Netherlands Society of Arboriculturalists.

When I was there, plants such as the Water Soldier, Irises and Rushes were starting to flower, while the submerged aquatics were showing good growth in crystal-clear water. To me, this area appeared as a 'back-to-nature' situation, with no large fish around to disturb the bottom substrate.

In the centre of the letter 'S', is an area of small troughs and pools on the ground, all well planted with aquatic, marginal and bog plants, and many incorporating running water. Some even had miniature water lilies. These tastefully arranged features would look great in any patio or (largish) balcony.

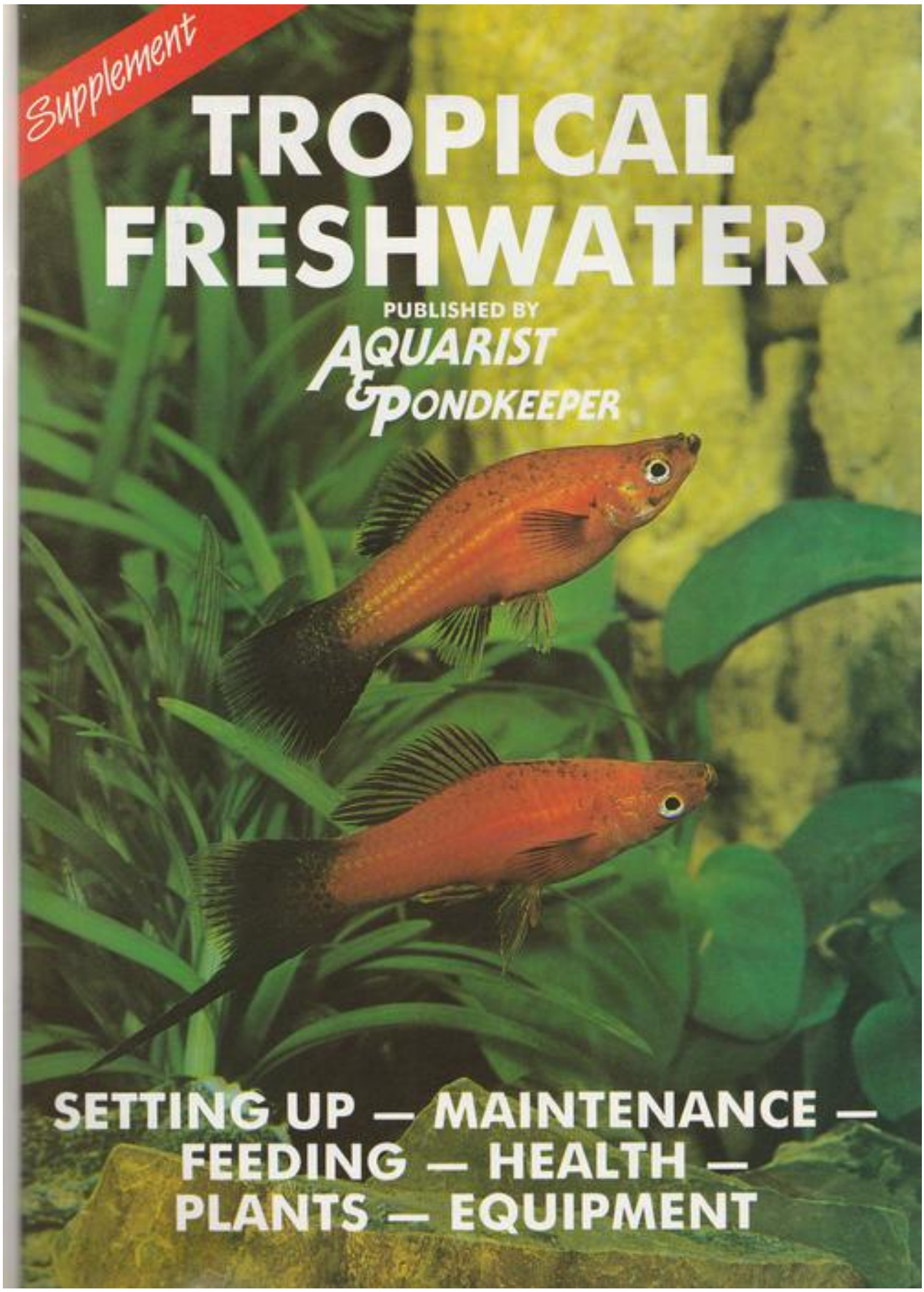
As far as I could see, though, there are no plant name plates 'in situ'. However, there is a pavilion close by where posters depict all (or most) of the species with their corresponding names. Also on display here are some of the pumps used to operate the various pools and troughs. In addition, the pavilion is permanently staffed, so information can be easily obtained if required (the Dutch speak very good English, which is a great help!). While visiting this exhibit, take a look at the fountain display at the end of the jetty — most unusual and attractive.

The only brilliantly coloured coldwater fish I managed to see were the Koi in the pools of the very large Japanese exhibit. This pavilion consists of a 'Classical Japanese Garden', the Koi making a very welcome focal point in the quiet waters. The theme of this exhibit is 'Water is the Source of Life. The invisible spring rises in the east and disappears invisibly in the west'.

It is well worth taking the time to look leisurely around the pool to appreciate how the shrubs, trees and small plants are used to enhance both the pool and garden as a whole.

The Trade, Transport an Distribution area of Floriade '92 is another must. It is situated by the main entrance and consists of an 8,000 square metre site, half of which constitutes a permanent exhibition. This section incorporates the 'Exposarium', a large exhibition hall which has 13 varying displays through the seasons. The 'Trade' pavilion seems to have something for everyone, while just outside, there is an area with craft shops where you can buy the odd souvenir or two as a fond memento of your visit to Floriade '92.

Holland is just across the Channel, so why not have a great day or two enjoying the Dutch way of exhibiting plants and water? There is so much to see that you'll need an absolute minimum of half to three-quarters of a day to get round. And, if you are planning to go, there isn't a great deal of time left . . . the event closes at the end of October. Opening hours: 9.30 am to 8 pm. Entrance: 20 Guilders (around £6.50).


Supplement
TROPICAL FRESHWATER
PUBLISHED BY
AQUARIST & PONDKEEPER
SETTING UP — MAINTENANCE —
FEEDING — HEALTH —
PLANTS — EQUIPMENT

# TROPICAL FRESHWATER SUPPLEMENT

PUBLISHED BY

AQUARIST & PONDKEEPER

*Cover Photograph of Red Wagtail Swordtail, by Max Gibbs, the Goldfish Bowl, Oxford*

## Supplement Contents




**EDITOR** John Dawes, **ART EDITOR** Ian Hunt, **ADVERTISEMENT MANAGER** John Young, **ADVERTISEMENT PRODUCTION** Gwen McNeil, **PUBLISHED BY** Dog World, 9 Tufton Street, Ashford, Kent TN23 1QN. **TELEPHONE: ADVERTISING AND PRODUCTION** 0233 621877, **FAX NUMBER:** 0233 645669

A well set-up tropical freshwater aquarium will provide a spectacular, relaxing and educational centrepiece in any living room.

# SETTING THE SCENE

*A & P* editor **John Dawes** prepares the ground for the other articles that follow in this **Supplement** by looking at the aims, requirements, potential and limitations of tropical freshwater aquarium keeping.

Aquaria vary enormously in shape, size, sophistication and price. However, they all share certain common qualities. Prominent among these is that, no matter how large an aquarium may be, the amount of water it can hold is a mere drop (if that) when compared to the volume of water that can be carried even by the smallest of streams. Yet, despite this drawback, the potential of the home aquarium as a source of relaxation, enjoyment, knowledge and satisfaction is virtually boundless. Every aquarist will vouch for this.

What other hobby can bring fishes from exotic, tropical countries right into the living room of every home, irrespective of geographical location or climate? What other hobby can provide an ever-changing living picture that never repeats itself? As a friend of mine so aptly put it some time ago, "There is always action — never an action replay". And, what other hobby can provide every follower with the opportunity of making new discoveries, or helping to conserve endangered species in as little as two cubic feet of water?

Keeping a tropical aquarium does all this and, as if to prove it, new clubs and societies are regularly being formed in every country to cater for the needs and interests of aquarists.

Home aquaria often house species of fish that would never meet in the wild. These Mexican Swordtails from Sanchez Tropical Fish Farm, for example, are likely to find themselves sharing their space with a Brazilian Catfish or an African Tetra. Yet, they survive remarkably well together.

## LIMITATIONS OF AQUARIA

No aquarium may be able to claim equality of status with most bodies of naturally existing water, but many can lay claim to coming quite close despite the inherent, unavoidable limitations they possess.

The fact that an aquarium is a container means that every time we set one up, we are, in a sense, encapsulating a little bit of nature and preventing it from interacting with the surrounding environment. In many cases, these little bits of nature can be extremely unnatural in that they can consist of collections of plants and animals which are never found together in the wild.

For example, a typical community tank is likely to include Mollies from Mexico, Dwarf Gouramis from India, Neons from the

Many types of fish, like this Albino Rainbow Shark from Ekkwill Waterlife Resources, have been created specifically for home aquaria and do not therefore exist in the wild.

HARRY GREEN/FLORIDA TROPICAL FISH FARMS ASSOCIATION

Amazon and Fighting Fish from Thailand! In addition, it may contain certain types of fish that do not exist in the natural state, e.g. Lyretail Swordtails, Fancy Guppies, Golden Barbs and others.

The situation as far as plants are concerned is no different, with *Cryptocoryne* species from Sri Lanka often rubbing shoulders with Water Wisteria from Malaysia, India, Burma and Thailand or *Ludwigia* from the southern United States and Central America.

Even when plants and fish are carefully chosen to represent genuine geographical assemblages, the simple fact that they are brought into contact with each other in numbers that do not reflect the real situation in the wild, places them in a somewhat unnatural setting.

A further consequence of enclosing a body of water is that, no matter how large the aquarium may be, it cannot be expected to react to external and internal influences as a stream, river, pond or lake can do in the wild.

Running water that is in constant interaction with the elements continually replenishes its stocks of essential ingredients as these become depleted, and purifies itself of waste and harmful chemicals by dilution, biological breakdown and other natural processes. This, of course, cannot occur to the same extent in aquaria.

Denied access to direct, overhead sunlight means that aquaria generally have to be supplied with artificial light. There have been spectacular advances in lighting technology in recent years, and it is fair to say that the majority of today's units are perfectly adequate for virtually every lighting requirement likely to be faced by aquarists. However, no one has yet managed to reproduce natural sunlight exactly. Indeed, it may never be possible to produce a lighting unit which can actually replicate sunlight and, at the same time, compare favourably in price with existing units.

There are other parameters, including water chemistry, currents, eddies and foodstuffs which cannot always find a perfect counterpart in aquaria. Since each of these can play a central role in the life cycles of fish and plants, the absence of one or more can set limits on the levels of success that can be achieved with some (in reality, few) species.

## BASIC AIMS AND REQUIREMENTS

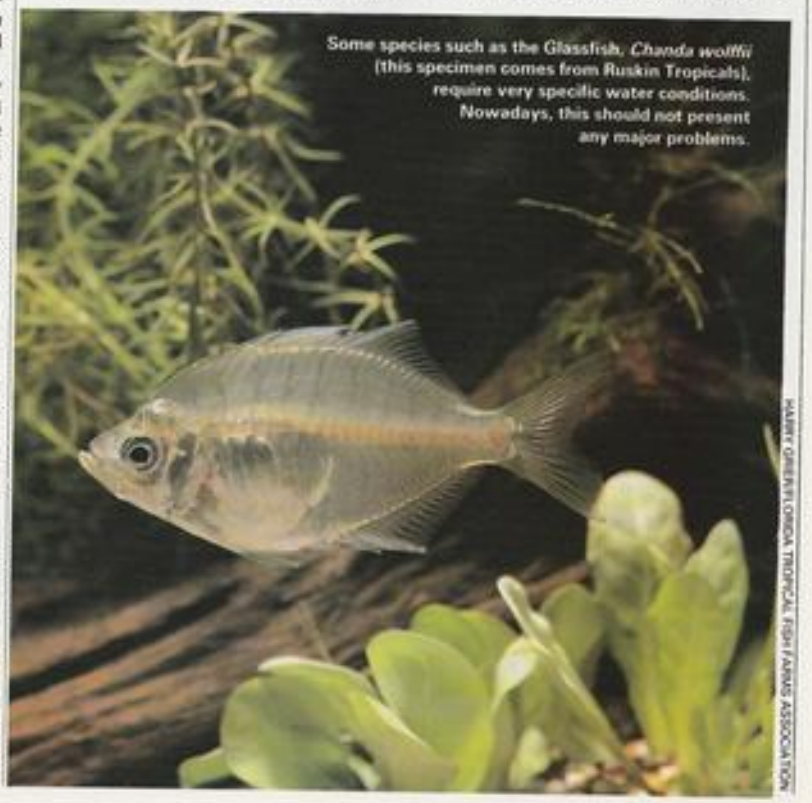
One of the main targets to aim for when setting up an aquarium is to attempt to get as close as possible to the requirements of individual species or the communities in which they are kept. If this is done, then a great deal can be achieved even in modestly sized aquaria.

Many species of fish are tough and resilient and can often survive in aquaria which may be inappropriately stocked and/or managed. When such instances are examined closely, it often turns out that the aquarium concerned has been set up from the human point of view.

A more reasonable approach would be to study the needs of the fish first and then set up an aquarium accordingly. In most cases, the result can be just as pleasing to the human eye and considerably more suitable for the fish.

In the wild, fish require adequate water conditions in terms of pH (acidity/alkalinity), hardness, oxygenation, purity, light and temperature. In addition, they may need shelter in the form of vegetation, rock crevices or caves. A balanced diet consisting of certain essential food items (animal, vegetable or both) is, obviously, also necessary. Further, some species may exist in large shoals, while others may lead predominantly solitary lives.

Details of the principles behind these and



Some species such as the Glassfish, *Chanda wolffii* (this specimen comes from Ruskin Tropicals), require very specific water conditions. Nowadays, this should not present any major problems.

HARRY GREEN/FLORIDA TROPICAL FISH FARMS ASSOCIATION

Shoaling species, e.g. Neon Tetras (*Paracheirodon innesi*), should always be kept in groups.

JOHN DAWES

other facets of the lives of aquarium fish and plants are given in the other articles in this **Supplement** in the hope that a fuller understanding of them may lead to a deep and lasting association with fish and their successful maintenance in aquaria.

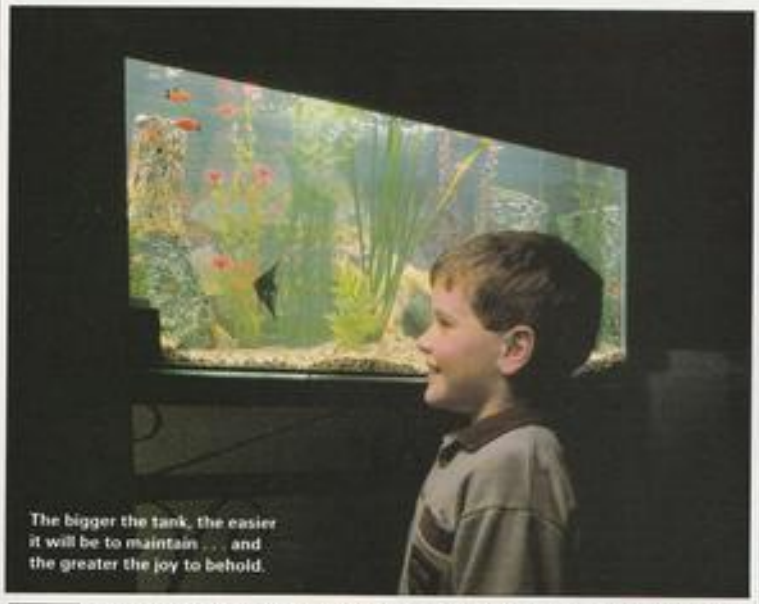
Most of the basic needs of both fish and plants may be adequately catered for with the aid of the extensive range of aquarium hardware, foods, remedies and accessories available today. Again, details of many of these are included in the articles that follow. Generally speaking, increased levels of sophistication are accompanied by increased efficiency. However, a great deal can be achieved with modestly priced equipment, particularly if this is combined with a caring and commonsense approach.

Although it may not prove practicable to supply every single requirement within an aquarium, we owe it to our fish to attempt to come as close to the ideal as is reasonably possible. Such attempts will usually result in healthy fish and a happy fishkeeper. **AMP**

# STEP-BY-STEP GUIDE TO SETTING UP AND MAINTENANCE

**Dr David Ford** of the 'Aquarian' Advisory Service guides you through the early stages of tropical freshwater aquarium keeping.

*Photographs by the author*



The bigger the tank, the easier it will be to maintain . . . and the greater the joy to behold.

The mere sight of a well-furnished tropical freshwater aquarium can create a strong urge to rush out and buy everything and anything that will allow you to replicate such a set-up in your own living room. However, this can spell disaster for both the plants and fish, not to say anything about the deflated enthusiasm and dreams of the would-be aquarist. To help you avoid such a scenario, here are some guidelines which should, at least, set you off along the right lines.

## SETTING UP

1 Choose at least a 60 x 30 x 30cm (24 x 12 x 12in) aquarium because, when furnished, this holds about 50 litres (just over 10 gallons) of water, the minimum amount to dilute the fishes' excreta. Smaller volumes (especially 'goldfish bowls') mean that fish will be stressed by the concentration of their own wastes (ammonia). 50 litres can accommodate 60cm or 2ft of total length of fish, excluding tails, without giving ammonia stress.

2 Choose a site that is near a power point but away from a bright window, especially if a sunny one. The sunlight will cause algae to grow, which will cloud the inside glass or even give green water.

3 Wash the aquarium using household cleaners such as Jif, but rinse away *every* trace because detergent will damage the fishes' gills.

4 Wash the gravel or sand thoroughly; a hose pipe running into a bucket of the gravel is best. Any trace of fine material will cloud the water in the tank.

5 Place the tank on its stand. The ideal is a specially made aquarium stand or cupboard designed to take the weight; remember that a tank of water can weigh as much as a person. Buffer the base with polystyrene ceiling tiles or, on metal stands, a run of draught excluder, because one grain of sand pressing on the bottom glass can give a fracture point as the water is added and the weight increases. If placed against a wall, leave room of a hand-width behind the aquarium to reach items that get dropped at the back!

6 Add the washed gravel or sand (or mixture — this is a good base for real plants) to a depth of 8cm (3in) and then rocks or ornaments in a pleasing design.

7 Then add tapwater via a bucket or hosepipe, with a plate placed on the base to take the cascade pressure, otherwise the gravel and sand will stir up. Fill to about 10cm (4in) from the top so the water doesn't overflow when you work within the tank.

8 Decorate with real plants (these are best bought pre-potted and the pots buried in the gravel/sand) or with plastic plants.

9 Fit a power filter (if you are planning to use an undergravel filter, this should have been fitted after Step 5), heater-stat and airstone, tucking away tubing and cables so they are not visible. Wiring is best run to a cable-tidy mounted on the side away from any little fingers.

10 The back of the tank, if not pre-painted, should have a backdrop scene or even wallpaper or kitchen foil fixed behind the aquarium. Do not use ordinary Sellotape; it will age and allow the picture to drop; the double-sided sticky tabs are best. The wires and tubing can then be loosely draped behind the tank but be invisible.

11 Add the lid with a lighting system. If fluorescent lights have a separate starter unit, this can be hung behind the aquarium on a strong picture hook hammered into the wall and the wires loosely draped so removal of the top is possible.

12 Connect the cable-tidy to the mains supply via a circuit breaker (any DIY store) . . . it is strongly recommended that this is always fitted for safety reasons. Although it is recommended that the mains supply is disconnected before working on the aquarium, in practice, this is often forgotten!

13 Switch on and check all the systems. Add a maturing tablet such as 'Aquarian' Tanksafe and leave for a week to mature. Daily, add a small pinch of fish flakes to feed the bacteria that will be developing in the water and filter media.

14 Buy the fish in small numbers, adding them over a period of weeks. Trios are best, choosing hardy community species such as Platies, Barbs, Tetras, Guppies, Swordtails, Angels, Gouramis. Mollies (not Black) should be the last to be added. Avoid difficult or special fish such as Discus, Black Mollies

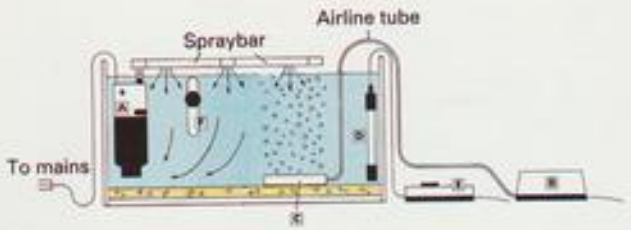
**Position rocks and plants for a pleasing effect. This newly set up aquarium will receive its full complement of fish over a period of several weeks.**


**Most manufacturers sell a range of equipment with full instructions for beginners.**

Cichlids and Catfish, other than Corydoras, until you are a more experienced aquarist.

15 Bring the fish home in a polybag in the dark. Turn off the aquarium lights and float the polybag in the aquarium for 10 minutes to equalise temperatures. Add a water treatment to the aquarium to protect the new fish, then cut the bag with scissors and pour the

## THE EQUIPMENT YOU WILL NEED




A A filter to clean the water

B An airpump to put oxygen in the water

(C more effective if an airstone is used)

D A heater thermostat to warm the water

(E the Aquarian Heater Thermostat has an *external regulation unit* for easy and safe control)

F You will also need a thermometer to check water temperature

fish into the tank. Leave for a day to acclimatise before feeding and using the lights.

## MAINTENANCE

1 Feed the fish daily at about the same time . . . they will soon learn to greet you. I would not recommend the use of aquatic live foods; they may introduce parasites. The modern quality flake foods contain all the nutrients fish require and can be safely fed exclusively for a long and active life. Live or special foods are only needed by fish breeders or hobbyists who keep unusual species.

2 Check the temperature frequently; an external digital thermometer is the best type to use.

3 Weekly, clean the glass with an algae magnet or non-scratch cloth such as a plastic pan scourer. Even if the glass looks clean, minute algal growths will be forming and it is best to remove them before they become visible because they etch the glass.

4 Siphon the bottom with a gravel 'hoover', or just a short length of plastic tubing, to remove fish faeces and mulm. Start a siphon by dipping the tube fully into the water, never by sucking. The water is a bacterial soup that you should not drink!

5 Replace the siphoned water with tap-water adjusted with boiled water to the same temperature as the aquarium (a finger test is close enough). This freshens the system and dilutes the total dissolved solids (such as nitrates) that develop in the water with age. It should not be neglected, even if cleaning is not done; a 10% water change should be carried out weekly. Make it 20% if two weeks go by.

6 Monthly, remove the power filter and clean the filter medium. This is best done in a bucket of water taken from the aquarium, rather than under a running tap where the chlorine will harm the useful bacteria on the medium. Just rinse off the collected mulm. Never sterilise, and only replace the medium if really necessary.

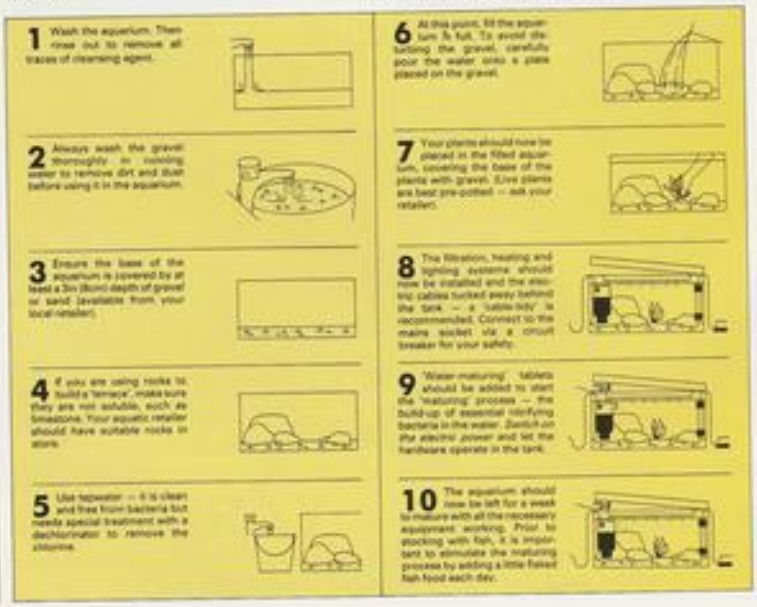
7 Trim any yellow leaves from the plants and never disturb the roots. Plastic plants can be removed and soaked in warm, diluted bleach, such as Domestos, overnight. Rinse away *all* trace of bleach (there should be no smell left) before 'replanting'. Do not scrub the leaves of plastic plants, it causes tiny scratches that allow algae to gain a hold.

8 Yearly, replace fluorescent tubes unless they are the type that do not fade with age (such as Triton). Also check airpump valves and replace if thought necessary (many models, such as the 'Aquarian' Airpump Kit supply a spare diaphragm).

9 A properly maintained aquarium should never require a complete strip-down, but if it does become necessary, do save most of the water for reuse, and do not clean the filter. This avoids 'New Tank Syndrome' where the fish become stressed from ammonia build-up in the raw water of a new aquarium.

10 If problems occur, do seek expert advice (see below for my address) rather than just adding chemicals. Remedies are available, but they only work if chosen from a proper diagnosis. Do not routinely add salt, for example . . . this is only needed for certain conditions. (See also **David Pool's** article on health and nutrition elsewhere in this **Supplement**).

Most fish diseases are caused by poor water quality and proper maintenance, as detailed above, will maintain good water quality, giving happy, therefore healthy, fish. This can be checked by measuring the nitrite (not nitrate) content. This toxin forms from the ammonia excreted by the fish. The simplest method is the dip-and-read sticks. The ideal value is zero, any trace of nitrite indicating a fall in water quality. **AMP**




### ADVICE

① If you are an absolute beginner, a booklet is available, post-free, by requesting *Fishkeeping for Beginners*' from Dr David Ford at **Aquarian Advisory Service, PO Box 67, Elland, W Yorks HX5 0SJ.** A postcard will do, but remember to include your name and address. The same address can be used for free help and advice on any fishkeeping subject

② Check out the latest books for beginners at your nearest aquatic retailer or bookshop . . . and order yourself a regular copy of *A & P*, of course!

③ Join, at least, your local aquatic society. Details are usually available at aquarium shops.

# TROPICAL FISH HEALTH AND NUTRITION

**Dr David Pool** of the Tetra Information Centre, sorts out the do's and don'ts regarding healthy fish and a healthy diet.

Maintaining fish in good condition should be the aim of every fishkeeper, whether they have a small community tank, or specialise in more expensive and difficult-to-keep fish. This is relatively easy, given the equipment and foods that are available today. However, to use these goods effectively, it is important that the aquarist understands what is required to keep fish healthy and what can cause problems to occur.

## ALL FISH ARE DISEASED

Before looking at how to maintain healthy fish, it is important to point out that *all* of the fish that we have in our aquaria, and for that matter, *all* of those that are for sale, are diseased! That is, they are all infected by, at least, one and often several, species of parasites. These parasites are, in fact, a natural part of the environment of the fish.

If the fish are in good condition generally, their immune system (the body's natural means of countering disease) will be active and capable of controlling the infection, ensuring that the parasites are only present in very small numbers.

Exactly the same is true in humans. Each of us is infected by a number of different species of disease organisms, such as cold viruses, flu viruses and, perhaps, something considerably more serious. But, if we are otherwise healthy, our immune system will naturally control these diseases, and we feel healthy.

If a fish does become unhealthy for any reason, for example, due to poor water quality, poor nutrition, stress, etc, the immune system will be suppressed, allowing the existing parasites to increase in numbers and cause problems. We are just the same — with many health problems occurring when we are run down or weakened.

A second situation when disease is likely to occur is following the introduction of new fish into the aquarium. Although these fish may appear healthy, they will, as already indicated, harbour small numbers of disease organisms. If the species (or even the strain) of parasite is 'new' to the fish in your aquarium, their immune system will not recognise the organism as being harmful and will initially not control it. As a result, the parasites may increase to dangerous numbers and cause the fish to become unhealthy.

## KEEPING FISH HEALTHY

The fish that are kept in aquaria are all sensitive to a variety of different factors that can weaken them, leaving them open to infection. Some of the more important are given on the next page.

Diet is very important for Guppies; a lack of Vitamin C, for example, can cause spinal curvature.

TETRA

Swordtails are hardy fish which can tolerate a wide range of water conditions.

TETRA

DAVID POOL

Gill Fluke *(Dactylogyrus vastator)* is a common parasite which may be present in small numbers even on apparently healthy fish.

Scats require a diet rich in vegetable matter if they are to remain healthy.

## Water Quality

Fish are particularly sensitive to poor water conditions and will suffer if not provided with a suitable aquatic environment.

Raised pollutant levels (ammonia, nitrite and nitrate) and sudden changes, or unsuitable values, of the pH and hardness are particularly important.

I would estimate that well over 80% of the problems which affect tropical fish are related to poor water conditions, so getting things right will have numerous benefits both to the fish and fishkeeper.

## Nitrogen Compounds

Excessive ammonia (concentrations above 0.25 mg/litre) can have adverse effects on the fish if maintained for any length of time. In most cases, the fish will show severe signs of irritation, and (occasionally) reddening on the skin and fins.

Raised nitrite levels (>3.0 mg/litre) can be directly toxic to the fish, leading to irritation of the gill and skin membranes and a reduction in the ability of the blood to transport oxygen. At lower concentrations, the fish will be weakened, allowing parasite numbers to increase.

Nitrates are unlikely to be directly toxic to fish in a tropical tank, unless the concentration is greater than (>) 50 mg/litre. Again, at lower levels, the fish will be weakened, leading to disease problems, together with poor coloration and growth.

## Pollutants

Raised pollutant levels are generally caused by overcrowding the fish, underfiltration or overfeeding. Each of these leads to the balance between the numbers of fish and the amount of filter bacteria which decompose fish waste being uneven.

Such pollutant problems, once identified, are relatively easy to overcome. A large partial water change using dechlorinated tapwater, will immediately dilute the problem, giving you time to identify the cause of the trouble.

As a guide, you should aim to have a stocking level of 1in (2.5cm) of fish length for every 12 sq in (900 sq cm) of water surface area. These fish should be fed 1-2 times each day on as much food as they will consume within a few minutes. Regular tank and filter maintenance is also important and is covered in greater detail in **David Ford's** article in this **Supplement.**

## pH and Hardness

The pH and hardness of the water can also influence the well being of fish. The fish we keep originate from different areas around the world and, not surprisingly, the water quality in these areas varies considerably. Amazonian fish for example, prefer soft acidic water, whereas those from many Mexican lakes and rivers (e.g. Swordtails) are used to harder, more alkaline, water.

To avoid potential problems it is advisable to measure the pH and hardness of tapwater and then select fish which are ideally suited to it. Fortunately, there is a large number of hardy fish which can survive in most conditions (e.g. barbs, danios, common *Corydoras* species and many livebearers) so your choice will not be limited.

Alternatively, fishkeepers may try to alter the water quality to suit the fish they wish to keep. Commercially available pH and hardness adjusters are available, but great care must be taken when using them to avoid sudden changes in water quality which can have disastrous effects on the fish.

The same is true when undertaking a partial water change. Make sure that any adjustments are undertaken outside the aquarium so that the water entering the aquarium is exactly the same as that already present.

Angels are — like most community fish — omnivorous. They will therefore feed on both plant and animal matter.

## NUTRITION

All of the fish kept in aquaria require a nutritionally balanced diet in order to remain healthy. In the wild, this is obtained in the form of many types of livefoods (e.g. insect larvae, worms and shrimps, and from plant or algal material). If there is insufficient food, or if it is of the wrong type, the fish in the wild will simply move to better areas.

## Commercial Diets

In an aquarium, the fish are reliant on us to provide them with a good-quality diet. Fortunately, there is now a range of prepared foods which are both convenient and easy to use. These are available in a powdered form (for fry), flaked form (for surface and mid-water feeders), granular form (for mid-water and bottom feeders) and tablet form (for bottom feeders).

It is a simple matter to choose a food that your fish will relish. But remember that all of the fish in, say, your community tank will not have the same nutritional needs, or feed from the same position in the water.

Most community fish (e.g. tetras, Angelfish and barbs) are omnivorous feeders, that is, they feed on a mixture of plant and animal material. These fish will thrive on one of the staple diets. There are, however, fish which require a vegetable-based diet (e.g. Mollies, Tinfoil Barbs and Plecostomus). This can be provided in the form of a vegetable flake or stick food. Carnivores, such as many cichlids, require a high protein diet, which, again, is readily available in prepared food.

## Live and Frozen Foods

Livefoods, while enjoyed by the fish, are of limited nutritional value and may introduce disease organisms into the aquarium. There are fewer risks associated with livefoods of non-aquatic origin (e.g. earthworms and white worms) or with cultured live foods (e.g. *Daphnia* and Brine Shrimp).

To eliminate any risk, you can feed your fish on freeze-dried foods. These foods are natural organisms which are carefully selected and prepared so that none of their nutritional value is lost.

## CONTROLLING FISH DISEASES

Even if the fish are given a good environment in which to live, and a nutritionally balanced diet, disease outbreaks may occur from time to time. Within the close confines

of the aquarium, these can have sudden and drastic effects. Fortunately, most of the serious and commonly occurring diseases of fish can be successfully treated, but correct identification of the problem and prompt treatment is important.

## Recognising Unhealthy Fish

Early recognition of an unhealthy fish is important if that fish is to be successfully treated. Aquarists are in an ideal position to identify unhealthy specimens, as they know the 'normal' behaviour of each fish and so can quickly recognise abnormal behaviour or coloration.

Factors which indicate poor health include gasping, rubbing, becoming darker or lighter colour, listless behaviour and an emaciated appearance.

If these signs are observed, it is important to have a closer look at the fish concerned in order to determine the cause. The secret here is not to jump to conclusions. Decide, firstly, why the fish is behaving as it is, and, then, what could cause it to do so. The possible causes can then be investigated to determine the *actual* cause.

For example, if a fish is seen to be gasping at the water surface, it is doing so because it cannot get sufficient oxygen (there is more oxygen in the water at the surface). This could be due to poor water quality (e.g. low oxygen concentration, high ammonia or nitrite levels), gill parasites or blood parasites. It is then necessary to decide which of these is responsible.

One clue to the cause of poor health can be found in the time of onset and its rate of spread. There are three main possibilities:

① If only one or two fish are affected and the problem does not spread to any other fish, this suggests a non-infectious disease or malformation.

② If a small number of fish are affected initially, but this number gradually increases, it suggests an infectious disease.

③ If the problem affects all of the fish in the aquarium, or all of the fish of the same species or size, and occurs very quickly, this suggests a water quality problem.

Other clues to the cause of bad health can be obtained by carefully examining the fish for signs of parasites. This can be achieved in the aquarium, but is better if the affected fish is placed in a large polythene bag where it can be viewed from all sides.

By taking the diagnosis stepwise and considering all of the likely causes of poor health, it is usually possible correctly to identify why a fish is unhealthy. Once this has been achieved, the correct treatment can then be administered.

## Treatment Tips

Badly diseased fish should be removed to a treatment container, whenever possible, to prevent disease spreading to other fish.

If more than two or three fish are affected, or if the disease is infectious, it is necessary to treat the aquarium. Before doing so, change 25-30% of the water and remove any excess debris, which would otherwise bind with some of the remedy, making it less effective. Debris in the aquarium gravel can effectively be removed without clouding the water using a Tetra HydroClean.

Filter media from box and foam filters should be quickly rinsed in old aquarium water to remove any debris, but not the helpful bacteria. Do not use tapwater to clean filter media as the chlorine may kill the helpful bacteria.

Always remove chemical filter media such as charcoal and zeolite, which would otherwise quickly remove any remedy added. Do not turn off or remove other filter media, which are essential for good water quality.

When treating unhealthy fish, it is advisable to maintain good water quality, raise the temperature 2-3°C — 3.6-5.4°F (with care) and ensure the diseased fish continue to feed — using livefoods if necessary. These actions will trigger the immune system of the fish, allowing it to overcome the disease.

## Treating Fish Diseases

The Table suggests methods of treating the more common diseases which will affect tropical freshwater aquarium fish. For more detailed information, it is advisable to consult your local aquatic shop and read some of the following texts.

① *The Fishkeeper's Manual of Fish Health* by Dr C Andrews, A Exell and Dr N Carrington, published by **Salamander.**

② *A Fishkeeper's Guide to Maintaining a Healthy Aquarium* by Dr N Carrington, published by **Salamander.**

③ *Water Chemistry and Fish Diseases* published by **Tetra.** AHP

## DISEASE DIAGNOSIS AND TREATMENT TABLE

| DISEASE | SIGNS | TREATMENT |
|---|---|---|
| Fungus (e.g. *Saprolegnia*) | White cottonwool-like growth on skin and fins. Only affects fish previously damaged by poor water quality, bad handling, etc. | Use Fungus treatment and improve tank hygiene. Avoid damaging fish. |
| Whitespot *(Ichthyophthirius multifiliis)* | Small pinhead-sized white spots on body and fins. Cause irritation to fish, which may rub, clamp fins, etc. | Add Whitespot treatment. |
| Fin Rot (Bacterial infection) | Fins become ragged and, in severe, cases reddened. Often affects fish previously damaged by poor water quality or bad handling. | Add Fin Rot treatment and improve water quality. |
| Sliminess of the skin (External parasite or poor water quality) | Severe irritation (rubbing, flexing), rapid gill movements, fins folded. Slimy grey coating on skin — most noticeably against eyes and dark areas. | Check water quality and improve if necessary. Treat with general external parasite remedy. |
| Pop-eye (Exophthalmia) | Eyes swollen, protruding out of sockets. Various causes. | Check water quality and improve if necessary — raise water temperature by 2-3°C (3.6-5.4°F). |
| Ulceration (Bacterial infection) | Red sores on body of fish, caused by bacterial infection of a wound (e.g. missing scale). | Isolate affected fish and treat with bacterial remedy. Raising water temperature will help. In severe cases, use antibiotic medicated food. |
| Gill Flukes | Irritation (rubbing, flexing, gasping and rapid gill movements). Fish often show sudden rapid movements, followed by lethargy. | Add suitable proprietary remedy to aquarium. |
| Swimbladder Disorder | Fish have difficulty swimming and float to surface or sink to bottom. Often affects Goldfish following overfeeding or sudden temperature change. | Feed small amounts of food more frequently. Maintain constant water temperature. |
| Mouth 'Fungus' *(Flexibacter* bacteria) | White tufts around mouth. Erosion of mouth region. | Treat with bacterial remedy. Improve tank hygiene. |

# THE ART OF TROPICAL PLANT SELECTION

Wise words of advice on how to choose tropical freshwater plants for the aquarium from **Barry James** of Everglades Aquatic Nurseries.
*Photographs by the author*

Every week hundreds of boxes of plants are imported destined for the nation's aquaria. Most come from Singapore, where they are grown in pools in an open field situation, or in raised benches in 'shade houses'. Others are from British and Continental growers who propagate plants and grow them on under glass in purpose-built nurseries.

## UNSUITABLE CHOICES

A quick check on a suppliers' list, however, revealed that, of 205 species offered, no fewer than 42 were not suitable for submerged growth in aquaria! In other words, 20% of all plants imported are not suitable for the purpose for which they are sold.

Of these unsuitable plants some are herbaceous species which grow on the jungle floor, while some others are cuttings or young plants of trees, shrubs and climbers. The rest are marginal plants inhabiting the banks of pools and streams. These latter types are often submerged for short periods of time in the rainy seasons, but are not able to cope with prolonged submersion.

Why do people buy them? I am afraid the short, brutal answer is ignorance. These plants are normally brightly coloured, or have exciting leaf designs. In addition to their unsuitability, some are also quite dangerous and can cause the tank to become toxic due to the juices which leach into the water as they decay. Others pollute the gravel as their roots decay.

**A beautiful true aquatic plant, *Myriophyllum brasiliensis* — one of the Milfoils.**

## PRESENTATION

Aquatic plants are presented in three ways.

① Most are top cuttings, often sold without roots. This is not a problem, as they soon grow roots when planted. It is wise to wrap pieces of lead wire carefully around the bases, in order to hold them in position until rooting takes place. Specimen plants such as Amazon Swords and all of the Cryptocorynes are sold with short trimmed roots, as are members of the *Vallimeria* and *Sagitaria* genera.

② Other plants, especially those grown under glass, are presented already growing in rockwool contained in small plastic mesh pots. They can either be removed from the pot and planted in the gravel with their roots still encased in the rockwool, or the entire pot can be buried in the substrate without the plant being removed.

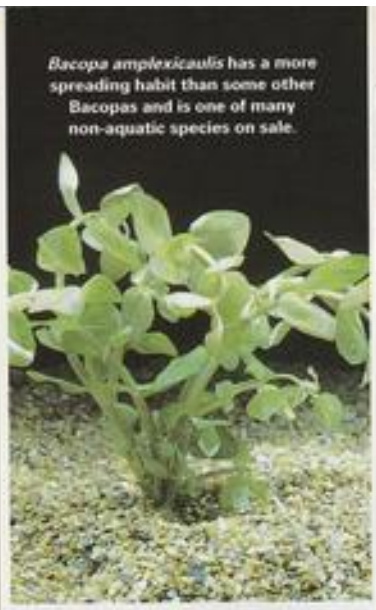
③ Plants from the genera *Aponogeton*, *Nymphaea*, *Crinum* and *Barclaya* are often sold as dormant tubers. These should be carefully inspected before purchase. They should be firm when squeezed, and should not be wrinkled. A small growing shoot may be present, but this is not always so. Any soft tubers should be discarded. Tubers which have deteriorated in storage smell abominably when squeezed and are almost certainly without vitality.

***Bacopa carolinana* is a truly aquatic member of the genus.**

## PLANT SELECTION

Very few aquarists prepare a planting plan before going down to their local supplier for the plants. However, many mail order com-

***Erchinodorus peruensis*: one of the many species of Sword Plant available for aquaria. Even if they are grown emerse in their nurseries, the vast majority will produce genuine underwater leaves within a relatively short time.**

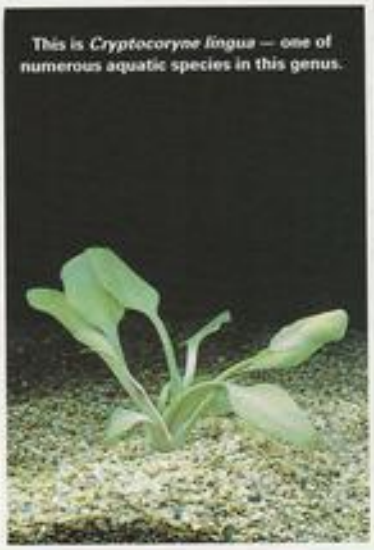


*Bacopa amplexicaulis* has a more spreading habit than some other Bacopas and is one of many non-aquatic species on sale.

The Borneo Fern (species unknown) may seem to hold considerable potential . . . but it is non-aquatic.

The various *Cordyline* species (this is *C. terminalis*) look good but are not aquatic in nature.

Two good underwater ferns: on the left, the finer-fronds of the Java Fern *(Microsaurium)* and on the right, the strap-like foliage of the African Water Fern *(Bolbitis)*.



This is *Cryptocoryne lingua* — one of numerous aquatic species in this genus.

Yet another non-aquatic — this time, *Hemyraphis colorata*, a striking plant that survives for quite a long time underwater.

## PLANTS SUITABLE FOR ALKALINE CONDITIONS (pH 7.2-7.8)

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Egeria densa* | Giant Anacharis | *Echinodorus cordifolius* | Sword Plant |
| *Ludwigia mullertii* | Red Ludwigia | *Acorus gramineus* varieties | Variegated Japanese Rush |
| *Cabomba aquatica* | Green Cabomba | *Bacopa monnieri* | Dwarf Bacopa |
| *Vallisneria spiralis* | Tape Grass | *Cardamine lyrata* | — |
| *Vallisneria tortifolia* | Twisted Vallis | *Cryptocoryne affinis* | — |
| *Sagittaria subulata* | Dwarf Sag | *Cryptocoryne blassii* | Giant Crypto |
| *Sagittaria platyphylla* | Giant Sag | *Gymnocoronis spilanthoides* | Spade Leaf |
| *Hygrophila polysperma* | Dwarf Hygro | *Ceratophyllum submersum* | Hornwort |

## PLANTS SUITABLE FOR ACID CONDITIONS (pH 6.5-7.0)

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Aponogeton crispus* | — | *Blyxa japonica* | Dwarf Japanese Rush |
| *Aponogeton undulatus* | — | *Crinum thaianum* | Water Onion |
| *Echinodorus major* | Ruffled Amazon | *Cryptocoryne usteriana* | — |
| *Echinodorus paniculatus* | Amazon Sword | *Cryptocoryne griffithii* | — |
| *Echinodorus tennellus* | Pygmy Chain Sword | *Cryptocoryne lingua* | — |
| *Barclaya longifolia* | Orchid Lily | *Cryptocoryne pontederifolia* | — |
| *Limnophila sessiflora* | Dwarf Ambulia | *Ceratopteris thalictroides* | Indian Fern |
| *Hygrophila difformis* | Water Wisteria | *Shinnersia rivularis* | Oak Leaf |

## PLANTS TO AVOID

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Croton* | — | *Dieffenbachia* | Dumb Cane |
| *Chlorophytum* | Spider Plant | *Chamaedorea* | Dwarf Palm Tree |
| *Dracaena* | Dragon Tree | *Fittonia* | — |
| *Hemigraphis* | Crimsonette | *Opiopogon jaburan* | Fountain Plant |
| *Selaginella* | — | *Pilea caderi* | Aluminium Plant |
| *Cordyline* | Red Dragon Plant | *Syngonium* | Goose Foot Plant |
| *Caladium* | Bleeding Heart | | |

## SMALL PLANTS FOR THE FRONT OF THE TANK (FOREGROUND)

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Echinodorus tennellus* | Pygmy Chain Sword | *Cryptocoryne lingua* | — |
| *Echinodorus tennellus* var: *pusillus* | Pygmy Chain Sword | *Marsilea crenata* | Dwarf 4-leaf Clover |
| *Cryptocoryne nevillii* | — | *Hydrocotyle vulgaris* | Dwarf Pennywort |
| | | *Lilaeopsis novae-zelandae* | Carpet Sword |

## MEDIUM-SIZED PLANTS FOR THE MIDDLEGROUND OF THE TANK

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Vallisneria tortifolia* | Twisted Vallis | *Bacopa myriophiloides* | — |
| *Didiplis diandra* | Water Hedge | *Bacopa monnieri* | Dwarf Bacopa |
| *Echinodorus* species | Amazon Sword | *Aponogeton boivinianus* | — |
| *Cryptocoryne beckettii* | — | *Aponogeton fenestralis* | Lace Plant |
| *Cryptocoryne ciliata* | — | *Barclaya longifolia* | Orchid Lily |
| *Anubias barteri* | — | *Lagenandra ovata* | — |
| *Ceratopteris thalictroides* | Indian Fern | *Nymphaea maculata* | African Tiger Lotus |

## TALL-GROWING PLANTS FOR THE BACKGROUND OF THE TANK

| Scientific Name | Common Name | Scientific Name | Common Name |
|---|---|---|---|
| *Hygrophila* species | — | *Rotala* species | — |
| *Vallisneria spiralis* | Tape Grass | *Egeria densa* | Giant Anacharis |
| *Vallisneria asiatica* | Giant Twisted Vallis | *Nomophila* species | Giant Hygrophila |
| *Vallisneria gigantea* (Deep Tanks) | Giant Vallis | *Hygrophila difformis* | Water Wisteria |
| *Aiabus congoensis* | — | *Cryptocoryne usteriana* (Deep Tanks) | — |
| *Limnophila* species | Ambulia | *Crinum* species (Deep Tanks) | Onion Plant |
| *Ludwigia* species | — | *Bacopa caroliniana* | — |
| *Aponogeton ulvaceus* | — | | |
| *Myriophyllum* species | Milfoil | | |

panies offer ready-made collections of plants designed to fill the various areas of the aquarium. They may also offer 'ecological' collections, so that the fishes and the plants come from the same geographical area.

One should also consider whether or not the plants you select are suitable for the type of water in the tank. Many species will fail in highly alkaline water, while others will do poorly in acid conditions.

Some fish, such as Discus, require high temperatures for successful culture. It therefore follows that the plants chosen to furnish such tanks should also be able to cope with high levels of warmth. Cichlids pose particular problems when it comes to plants. Those chosen to furnish such tanks should have strong rootstocks, and very tough leaves to be able to suffer the depredations of these vigorous fish. MP

## PLANTS FOR GROWING ON BOGWOOD AND ROCKS

| Scientific Name | Common Name |
|---|---|
| *Microsaurium pteropus* | Java Fern |
| *Bolbitis heudelotii* | African Water Fern |
| *Vesicularia dubyana* | Java Moss |
| *Anubias nana* | Dwarf Anubias |

## FLOATING PLANTS

| Scientific Name | Common Name |
|---|---|
| *Salvinia* species | Butterfly Plant |
| *Limnobium* species | Amazon Frogbit |
| *Pistia stratiotes* | Water Lettuce |
| *Ceratopteris cornuta* | Floating Indian Fern |
| *Ceratophyllum submersum* (Floats just below the surface) | Hornwort |
| *Riccia fluitans* (Floats just below the surface) | Crystalwort |

# EQUIPMENT OVERVIEW

## BY DICK MILLS

*Photographs — unless otherwise indicated — by the author*

Part of our editor's enjoyment of putting together *A & P* each month comes from finding the unexpected in an article while, for the contributors, the difficult part is supplying just that! Take this month for example: an overview of equipment for beginners to tropical freshwater fishkeeping.

OK, it's a simple operation to list out the various bits and pieces on the market, pointing out what you need and what you don't. But people aren't daft; they've got a pretty good idea of the basic set-up and can quite easily see what's available (in their price range, too) down at their aquatic dealer, without a patronising rigmarole in these columns.

What probably worries the newcomer more is that, despite knowing a certain piece of equipment is vital, there is a complete lack of knowledge of how it does what it's supposed to do. Perhaps this piece should therefore have been entitled 'Inside View'?

Among all the 'necessary' equipment the 'Big Four' are heating, lighting, aeration and filtration.

## Heating

Unless you're one of our fortunate readers living in the tropics, where the average daily temperature is something we can only dream about, the keeping of tropical fishes (freshwater or marine for that matter) requires their water to be kept constantly warm.

An aquarium in an apartment in a large, centrally-heated block of flats in a large city, might just be practicable, but you may have to choose your species a little carefully. The majority of tanks are therefore kept warm by simple electrically-powered miniature immersion heaters.

To keep the temperature steady, around a mean 25°C (77°F), an automatic thermostatic controller is needed. Before anyone panics, these are usually built into the same unit as the heating element, and the whole thing depends on one connection to the mains supply. However, there are several new types of *separate* external thermostatic units on the market (generally using micro-chip circuitry and capable of keeping a recallable memory of 'high' and 'low' temperatures reached) which do need connecting to a separate heater.

**The in-line controller with this aquarium heater maintains the correct temperature in association with the sensing device built into the heater itself.**

If you want to use these types, say, for extremely accurate temperature control, and are having difficulty finding separate heater units, bear in mind that you can use conventional combined internal thermostat/heater units, providing you set the thermostat on the combined unit to a temperature *above* that of the separate thermostat. (Phew! I think that's about the upper limit of technology you are likely to come across in this piece!)

Separate external thermostats are also necessary to control alternative heating devices, such as undergravel heating cables, and don't forget to consider using external 'undertank' heating mats either.

A more recently-introduced system uses a diverted proportional feed of warmed water from a conventional thermostat/heater unit to flow through pipes under the gravel to provide rising currents of water in the substrate which assists plant growth.

## Lighting

The choice of lighting systems depends on personal taste, running costs and types of aquarium being kept. Ignoring the first, the choice is usually between tungsten lamps and fluorescent tubes, with the tendency moving towards the latter, particularly as the 'fit a plug, add water and you're ready to go' complete beginning aquariums have these lamps already supplied.

Initial financial outlay is higher for 'tubes', but periods between lamp replacements are longer and running costs are lower. For more ambitious displays, especially deeper tanks, more expensive pendant-type metal halide, mercury discharge lamps are better, but these, like fluorescent tubes, require a starter unit which has to be accommodated somewhere.

**This modern digital-readout thermostat has extra features such as selectable Fahrenheit or Centigrade display, current or set temperatures, fast or slow update, LO indicator and a useful 'disable set' mode.**


**Light enhancers will make the most of any type of 'in-hood' illumination provided.**

The amount of lighting needed varies, too, from aquarium to aquarium: that required to illuminate say a Cichlid-inhabited, rock-furnished collection with only plastic plants differs greatly from that needed to provide enough photosynthesising energy for a lushly-planted underwater jungle, beloved by our Dutch friends.

Control of lighting is now just beginning to emerge from the 'switch it on, switch it off' prehistoric era. While time-switches have been around for many years, only recently have dimming devices become available for fluorescent tubes (see **Product Round-up**, *A & P*, Sept '92).

Whatever lighting is fitted, make the most of it by keeping the cover-glass clean, by fitting fluorescent tube reflectors, or by painting the hood interior white or lining it with cooking foil.

## Aeration

Perhaps aeration is a misnomer these days, but air-pumps continue to be required to operate some of the water-moving filtration systems which coincidentally provide the same surface-agitating, 'oxygenating' effect that air-pumps and airstones were formerly employed to do.

The commonest design of pump uses the 50 times a second alternating current frequency of the electrical supply (60 cycles per second in the USA) to vibrate a diaphragm which pumps the air. In order that the air doesn't just wobble to and fro in sympathy with the vibrations, a set of tiny non-return valves makes sure the air only flows in one direction.

The air-pump is a lot more complicated than most people assume. There is a small felt pad fitted — usually underneath — (don't forget to clean it from time to time) to filter the air before it is pumped to protect the internal valves from blockage.

Most models have silencing devices fitted, too; these may take the form of special absorbent feet, sound-deadening mounts to vibrating parts, insulation surrounds to outlet nozzles, and extra resonance-damping circuits to the valve-chamber. In addition to all of these measures, actual output volume of air can be controlled mechanically by a needle-valve adjuster or, electrically, by a variable internal resistance, again adjusted by an external knob.

Further up the output (and expense) scale are rotary piston and vaned pumps. These provide much more air than the average-size diaphragm pump and are ideal for a large number of tanks, such as found in fish-houses. These types need much more regular lubrication and maintenance if they are to perform at peak performance. It is usual, in such systems, to arrange a 'ring-main' of hose-pipe feeding air around, and have individual 'T' pieces down to each tank as required.

Whatever the type of air supply or its distribution, the best control of air is afforded by air-valves which allow individual adjustment between filters and airstones.

Bearing in mind the length of time we expect our pumps to last (and most of them do, despite lengthy periods of non-maintenance), it makes sense to look after them. A wise extra precaution is to fit a non-return valve in the airline to prevent back-siphoning of water into the pump body should the electrical supply fail, especially where the pump is sited well below the level of the aquarium.

## Filtration

Everyone understands the basic practice of filtration, with the need to keep the water as free as possible from suspended matter and dissolved wastes, but newcomers might not be as sure how such results are achieved.

**This complete internal filter has built-in heater (right), impeller with variable flow and rotational return adjusters, diverted flow to 'dry' trickle filter area (white medium seen through window with pre-filter floss above and hexagonal ceramic pieces [unseen] below), pre-filter combs backed by foam block (next to heater), combined floss and carbon sandwich layer. Water enters through slots at bottom.**

**Suspended matter** is easiest to remove; simply straining the water through a suitably-sized medium such as floss or foam generally does the trick. **Dissolved wastes** can be removed by using a medium, such as activated carbon, on which they can stick (adsorption). All box-type filters (whether internal or external, air- or electrically-powered), use these two methods primarily.

Choose a filter to suit your tank size (also allow for the 'dirtiness factor' of your fishes). Many new models of filters are tailored to suit most standard tank sizes, this being less confusing than flow-rates, which may merely quote gallons per hour (Imperial or US).

There is often confusion over **undergravel filtration**, with some people assuming that the gravel acts as a straining medium, cleaning the water mechanically as it passes through. But, as the system is more correctly termed 'biological', there must be more to it than that.

What actually happens is that the water-flow through the gravel (either in an 'up' or 'down' direction, depending on design) supports a colony of bacteria which reduce toxic compounds, such as ammonia-based materials in broken-down fish wastes, first into less toxic nitrites and then into much safer nitrates.

Such systems take several weeks, or months, to become fully operational and fish stocks in the new aquarium should be built up gradually to allow the cleansing bacterial colony to keep pace with the rising amount of waste products.

Ways exist to accelerate this establishing period. Proprietary sachets of live bacterial cultures can, for example, be added, or even some gravel from a long-established aquarium. The presence of some hardy, nitrite-tolerant fish will also naturally assist by producing the 'raw materials'.

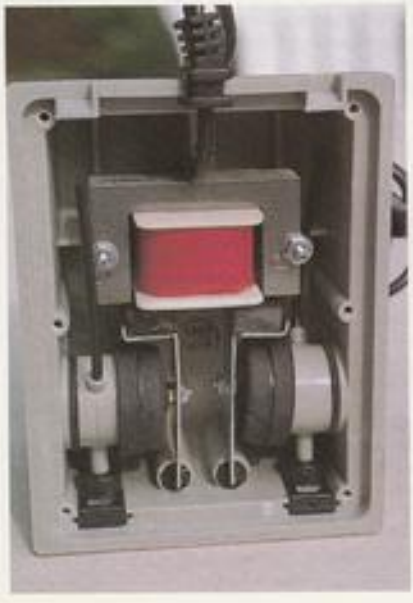
Reverse-flow systems use a power-filter to push the water through the gravel from below. This means that because the water is pre-filtered before passing through the gravel, the gravel is less likely to become clogged.

Problems with plant growth when using biological, undergravel, filtration are supposedly legion, but these adverse effects can be minimised (see **Mary Bailey's** article, *A&P*, July 1992).

Further treatment of water through trickle filters, either above the tank (through algae beds) or behind (using bacteria) can convert nitrates back into free nitrogen and so complete the water filtration process.

Maintenance of filters is critical to their continuing efficient performance. Filter floss and activated carbon should be replaced regularly (many filters have built-in flow indicators to show that cleaning is needed).

Cleaning should be done using aquarium water to rinse the floss; this is so that any



**The thin black pipe emerging from each of the twin diaphragm/valve chambers is a silencing device; below these, vibration-absorbing mounting blocks for the outlet pipes can be seen.**

**This powerhead (half-length spraybar shown fitted) has a universal-fitting adaptor to suit various uplift tube diameters from under-gravel biological filter systems, flow indicator (shows when filter is clogged), variable flow regulator and a variable directional return if spraybar not used.**

bacterial colonies that may have become established (even though box-type filters are not generally thought of as having a biological function, most canister filters turn 'biological' when long established) are not destroyed as they would have been if tapwater was used.

Some new filters are designed to use all forms of filtration methods. Raking the gravel lightly prevents caking occurring and so helps to maintain water flow.

Regular partial water-changes should not be neglected either, as these dilute the dissolved waste levels. Some of the accumulated detritus on the gravel surface can also be removed during this operation.

Obviously, there are many extra refinements that you can consider fixing to your aquarium, but a firm understanding of the 'basics' will stand you in good stead over many years, while any new supposedly-indispensible gadget could possibly lose its true worth in a few weeks.

# Herpetology matters By Julian Sims

## CAPTIVE-BRED STOCK

Herpetologists who maintain amphibians and reptiles in captivity are sometimes accused of helping to cause the depletion of animal populations in the wild. Reasons given include over-collection to supply the pet trade and irresponsible purchasing when the animals are offered for sale.

Unfortunately, such accusations are given credibility when large consignments of reptiles and amphibians are imported into Britain without the necessary documentation. For example, in late July of this year, an illegal shipment of geckos and frogs from Madagascar was seized by H.M. Customs officials at Heathrow Airport.

Such adverse publicity does little to promote the positive side of keeping amphibians and reptiles, or highlight the very real problems that many animals (and plants) face in the wild due to the destruction of their natural habitat. For example, the Axolotl *(Ambystoma mexicanum)* had a very limited geographical range, being found in only two lakes to the south of Mexico City in Central America.

One of the two lakes, Lake Xochimilco, is being developed by the local tourist industry to make the most of its famous 'floating gardens' or *chinampas*. The long-term stability of this lake and, thus, the survival of the Axolotl there, must be in question. The other lake, Lake Chalco, has already been destroyed as a result of the over-zealous extraction of water for domestic and industrial use.

Fortunately, Axolotls readily breed in captivity and, if sensible precautions are taken to ensure the genetic purity of the species, it can be saved from extinction. However, such an achievement is only possible because, in the past, **some** animals were removed from the wild.

To encourage this aspect of keeping amphibians and reptiles, the **British Herpetological Society (BHS)** is holding a *Captive Breeding Open Meeting* in November. The meeting will provide the opportunity to buy and exchange many species of frogs, toads, newts, salamanders, lizards and snakes, all of which have been bred in captivity. Helpful advice about how to maintain these animals will be available from members of the BHS Captive Breeding Committee. A wide range of equipment and books about herpetology will also be on sale.

The Open Meeting will be held in the afternoon of **Sunday 8 November** from 2 to 6 at:

The Denham Community Centre,
Oxford Road,
New Denham,
Uxbridge.

The BHS Captive Breeding Committee have also organised an afternoon meeting in December, when the guest speaker will be the reptile breeder **Bert Langerwerf.** Although famous for his original captive breeding work in The Netherlands, Bert now lives in the USA, and the title of his illustrated talk will be *Breeding Exotic Lizards in Alabama.*

The meeting will take place in London on the afternoon of **Saturday 5 December** from 2 to 5.30. The meeting will be divided into two 45-minute sessions, with a break and an hour for discussion and questions.

The meeting will be held at **Birkbeck College (University of London), Malet Street, London WC1.** However, as places are limited, BHS members will have priority and non-members will be admitted only if the lecture theatre has unfilled seats.

## BLADES BIOLOGICAL

I am frequently asked where certain species of amphibian (and reptile) can be obtained. In past editions of **Your Questions Answered,** I have recommended **Blades Biological of Edenbridge, Kent,** because this company list a number of hardy species in their biological supplies catalogue.

**K Steinberg** from Blades Biological has recently written to say that the company will only supply **Educational Establishments** and not private individuals.

In particular, Blades are suppliers of invertebrates, and a species which they now stock is the Wax Moth *(Galleria mellonella).* A Wax Moth life cycle study kit containing a large batch of eggs is available or, alternatively, cultures of ready-hatched larvae can be supplied. These larvae are easily maintained and are a suitable live food for a wide variety of amphibians and reptiles. Tubs of a specially formulated medium in which to culture Wax Moth larvae are also available.

ALL HERPETOLOGICAL QUERIES FOR YOUR QUESTIONS ANSWERED SHOULD BE ADDRESSED TO JULIAN SIMS, c/o *A&P*

Green Toad *(Bufo viridis)* — an attractive amphibian frequently bred in captivity.

# COURTESY OF OCEAN NUTRITION AND UNDERWORLD PRODUCTS . . . WITH A LITTLE HELP FROM *A & P* AND THE CORAL WORLD — EILAT

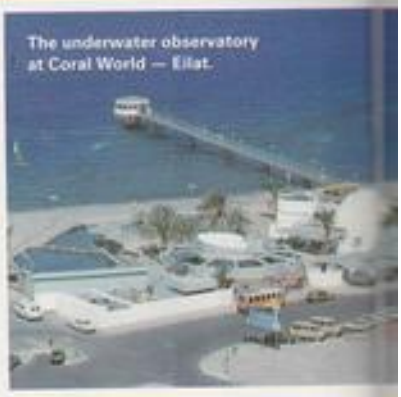
# WIN A RED SEA


## THE PRIZE

To summarise, here's what you can win:

1. **A one-week holiday for two,** to include return air tickets between London and Eilat, paid for by **Ocean Nutrition** and **Underworld Products.**
2. **Bed-and-breakfast** for one week at one of the **top hotels** in Eilat, also covered by **Ocean Nutrition** and **Underworld Products.**
3. **£300** in spending money donated by ***Aquarist & Pondkeeper.***
4. **Free passes** for two people to the Coral World Aquarium and Observatory for the whole week*.
5. **Behind-the-scenes tour** of the Coral World*.
6. **Guided snorkelling tour** of the Coral World Underwater Nature Reserve*.

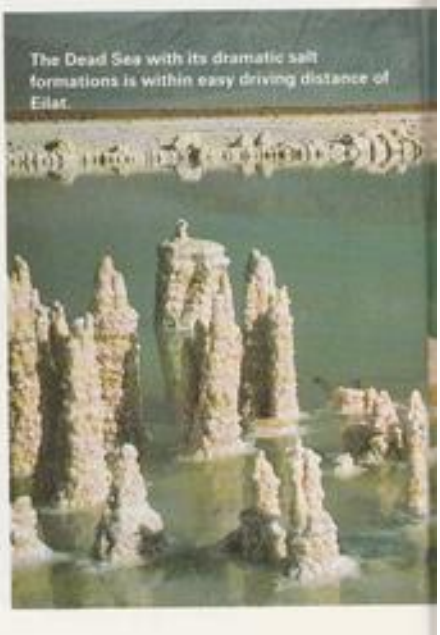
* These prizes are all being arranged by **Coral World — Eilat.**


The underwater observatory at Coral World — Eilat.

## THE COMPETITION

So, what do you need to do to earn the chance to win this superb prize? It's all quite simple:

1. Read the article written by *A & P* editor **John Dawes** in this issue of the magazine. It's entitled **Going to Great Depths for the Best.**
2. Find the **Ocean Nutrition** advertisement in this issue of *A & P.*
3. Answer the **five competition questions** which appear on the next page.


The Dead Sea with its dramatic salt formations is within easy driving distance of Eilat.

It's the stuff dreams are made of! Just think of it; a week-long holiday for two people in the coral reef paradise of Eilat on the shores of the magical Red Sea!

You can enjoy all this while, at the same time, providing your fish and invertebrates with a top-grade, highly nutritious diet brimming over with goodness and freshness. What else could an aquarist and his or her fish and inverts possibly wish for?

Imagine stretching out on Eilat's world-famous Coral Beach, gazing out on to an impossibly blue, clear and deliciously warm coral sea, with reefs a mere flipper-stroke away, and delightful tiny Boxfish swimming round your ankles the moment you step into the water.

As you lie on the beach, you can see, on your right, the long jetty that leads on to **Coral World's Underwater Observatory,** which gives you a unique panorama of the coral reef and its inhabitants without even having to get your feet wet. As part of your prize, not only will you be able to visit the observatory and Coral World's unbelievable aquarium (which houses the world's best Red Sea collection) absolutely **FREE OF CHARGE** for the whole week, but you will also win:

- A behind-the-scenes guided tour of Coral World
- A snorkelling tour of the coral reef that forms part of this spectacular underwater nature reserve.

As you flip over to your left side to catch the sun, you can see Eilat 'just down the road'. There, you'll be staying at one of the **top hotels** in the resort, on a **bed-and-breakfast basis.**

And that's not all! To help you enjoy your holiday even further, ***Aquarist & Pondkeeper*** will be chipping in with a nice fat cheque for **£300** for you to use as your spending money!

# HOLIDAY FOR TWO

*Part 1*

View the reef surrounding Coral World . . . without getting your feet wet . . . and absolutely free for the duration of your stay.

## THE QUESTIONS

1. How many species of sponge does the **Angel Formula** food from **Ocean Nutrition** contain?
2. Are these species: **abundant, rare or endangered?**
3. How many foods are there in the **Professional Signature Series?**
4. What food in the **Aqua-Yums** range is particularly good for Triggerfish?
5. What is the name and full address (as published in the advertisement in this issue of *A & P*) of the **Sole UK Agent** for **Ocean Nutrition?**

4. **SAVE** your answers until next month. This is a two-part competition, so please **DON'T** send in this month's answers.

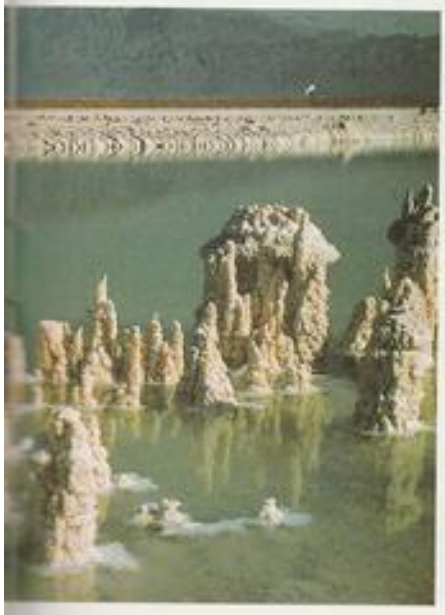
5. Buy a packet of **Ocean Nutrition** deep-frozen food and remove the label. You will need to send this in with your full set of answers next month in order to qualify for the prize draw.

6. Make sure that you obtain a copy of the November issue of *Aquarist & Pondkeeper* — the second (and final) set of questions will appear then. You'll also need to have this copy handy, so hang on to it!

**Ocean Nutrition's recently-launched Professional Signature Series.**

## THE RULES

1. Write your answers to the competition questions on a postcard or stuck-down envelope.
2. Write your FULL name, i.e. including full first name and address, in BLOCK CAPITALS on your entry.
3. SAVE the answers to this month's questions until next month (November), when you will need to submit your answers to BOTH parts of the competition, along with a label from any **Ocean Nutrition** food.
4. Send your completed entry to:
   **Aquarist & Pondkeeper,**
   **Ocean Nutrition/Underworld Products Competition,**
   **9 Tufton Street,**
   **Ashford, Kent TN23 1QN.**
5. Closing date: **30 November 1992** (first post).
6. Only ONE entry per household will be accepted.
7. No correspondence will be entered into regarding the competition.
8. The judges' decision will be final.
9. No responsibility is accepted for entries lost, delayed or damaged in the post, and proof of posting will not be accepted as proof of delivery.
10. The first correct entry drawn on **1 December 1992** will be awarded the prize.
11. The winner's name will be announced in the January 1993 issue of *Aquarist & Pondkeeper.*
12. The holiday won in this competition must be taken (to start) by **31 March 1993, AT THE VERY LATEST.**
13. This competition is open to all UK readers of *Aquarist & Pondkeeper,* but not employees or their families of ***Aquarist & Pondkeeper,* Dog World Ltd, Pet Business World, Ocean Nutrition, Underworld Products Ltd, or Coral World — Eilat.**



**Don't miss this golden opportunity to net yourself a fantastic prize.**

# OUT AND ABOUT

## GRANGE PARK AQUATICS

By Alan Townsend

*Photographs by the author*

G.P.A. is a family business, run jointly by **Kevin Johnson** (who is a qualified biologist and a member of the Institute of Fisheries Management), his wife **Elaine**, and Kevin's father **John**.

They have bred fish and owned fisheries for about ten years now and moved onto their present 22-acre site five years ago. Of these 22 acres, 12 are now developed.

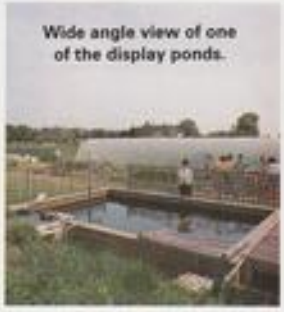
G.P.A. now specialise in rearing and growing on (principally) Koi, and I must admit to not having seen such quantities or quality of Koi, of all sizes, before in Lincolnshire or Humberside. The varieties and markings of the fish in display ponds and growing ponds are really breathtaking.

On arriving at G.P.A., which is set well back from the main road, there is a large car parking area, and you will more than likely be greeted by Jess, the family pet Border Collie, who will ceaselssly return with any object thrown for her. Walking into the initial sales area, there are 19 small display tanks, with an assortment of small fish: Comets, Sarassas, Shubunkins, Orfe, Tench, Ghost Koi, Mirror Carp and Koi. Pond plants are also on display. There is also a small dry goods sales point (an area that Kevin is intending to expand in the future).

Walking through the first area, I arrived at the display ponds. There are seven filtered display ponds, totalling approximately 18,000 gallons (some 82,000 litres). Here, fish can easily be viewed and photograph albums on the pond sides are provided so that, at a glance, prices for varieties can be easily obtained. Watch out for the family's pet giant Mirror Carp in one of the filtered ponds!

Following the signs to the growing-on ponds, you soon appreciate that this is no small site. There are 13 main ponds. Of these, 10 are approximately ½ to ½ an acre in size, and the remaining 3 are 1¼ acres each.

General view including some of the display ponds.



Wide angle view of one of the display ponds.

Kevin Johnson bowls a Koi for a customer.

Close-up of some 12-16in G.P.A. Japanese Koi.

All the ponds are dug out, and standing on the bank, one is looking down from a relatively high viewpoint (which is excellent for surveying the whole pond and viewing feeding fish closer in).

At first, there doesn't appear to be a lot of activity in the pond, but upon throwing a handful of fish pellets into the water (you can obtain food from the sales area), Koi appear seemingly from nowhere, and the gracefulness and exotic markings of the fish can be fully appreciated.

All the fish in each pond come to feed, and those in one pond in particular, marked Mirror Carp, were insatiable. The first handful brought a response that I likened to "rats crawling over each other's backs", to get the food. Bow-waves from carp spread over the lake as the small Mirrors raced to me. Upon walking alongside this pond, it soon became apparent that these carp responded to footsteps and a human silhouette. What an amazing sight!

Returning to the sales area, I spoke to Kevin about G.P.A.'s operations. He said, "We are a rearing and growing-on unit. We do not breed our own Koi. Generally, 4 to 6in selected fish are obtained from various UK suppliers and we also import direct from Japan, China and Israel. Fish arrive on site and are quarantined in special tanks or ponds. After the quarantining period, they are then stocked out for growing into the larger area ponds, for anything up to four years. If a customer sees a fish in the growing-on ponds that he or she wishes to purchase, they can have first refusal when the fish is netted. This can take some time because of the size of the ponds.

"Fish taken out of the growing ponds are quarantined for a second time before being introduced into the display ponds. The Mirror Carp we grow are sold mainly to angling clubs for re-stocking of waters. We also offer specialist advice on pond and filter construction and any associated problems, fish treatment, etc. Our dry goods side is rather small at present, and we intend to develop this area with a brand new building. We are presently able to offer pumps, liners, pipework, filters, filter media, food and medicine."

Located approximately 3 miles south of Scunthorpe, and 1 mile from Messingham village, access via the M180 is, for the long distance traveller, relatively easy.

**Opening hours:** 11 am to 6 pm. Closed Wednesday. These details apply from mid-March to the end of October. The winter 'close-down' runs from November to mid-March but, even so, Kevin, Elaine and John are happy to receive customers (BY APPOINTMENT ONLY) during this period.

For further details contact **Kevin, Elaine** or **John Johnson, Grange Park Aquatics, Sands Farm, Butterwick Road, Messingham, Scunthorpe, South Humberside DN17 3PN. Tel: 0724 762115.**

# OUT AND ABOUT

## KOI '92

### By David Twigg

Over the weekend of 15/16 August, Billing Aquadrome, set in the Northamptonshire countryside, became home for thousands of Koi keepers who thronged to see some of the finest Koi in the UK. Over nine thousand people passed through the door over the weekend which equates to a 13% increase on last year.

This annual show, sponsored again this year by **Pet Products International Ltd,** lived up to its well-earned reputation and produced an excellent display of fish in competition for some beautiful trophies.

Some 54 competitors entered a total of 499 Koi in all, housed, for the first time this year, in their own vats (English style); these, in their turn were housed in a superb "self-supporting" marquee which gave excellent shelter from the elements, both good and bad. Improved 'electrics' and new air blower equipment brought conditions for public, dealers and Koi alike up to a very high standard indeed.

Housed in conventional marquees, to complement the many wonderful Koi displayed in the main arena, were almost 30 dealers who not only had numerous Koi to catch your eye, but also displayed a wide range of dry goods. The complementary hobbies of Bonzai and garden ornaments were also well represented.

A well supported Arts & Crafts centre was available for the non-Koi nuts among us and a display of Birds of Prey proved very popular. *A & P* had its stand selling current and back numbers of the magazine and a wide variety of aquatic books.

But back to the Koi . . . what a magnificent display! The judges, once again led by **Alan Rogers,** had the unenviable task of selecting winners from such a good selection of Koi. They chose as **Grand Champion** a superb **Showa** entered by **Joe Wilmington.** This same Showa was Tategoi Champion at "Koi '90", and by its award this year has proved that earlier decision by the judges to be absolutely spot on. Joe's Showa was also awarded **Best Mature Koi in Show.**

At the prize presentation, Joe, and all the other prizewinners, received their magnificent trophies from **Ron Sharp** of show sponsors **Pet Products International.**

Other major prizewinners were: **Best Adult Koi** (Kohaku), **Neil Cussins; Best Baby Koi** (Kohaku), **Mrs J Coleman; Best Size 1** (Kohaku), **Mrs J Coleman; Best Size 2** (Kohaku), **Mrs J Coleman; Best Size 3** (Kawarimono), **M Perkins; Best Size 4** (Kohaku), **Neil Cussins; Best Size 5** (Showa), **Joe Wilmington; Best Size 6** (Sanke), **Eric Sida.**

Variety winners were: **Kohaku;** Mrs J Coleman, Ryan Sida, Neil Cussins, Grant Clifton. **Sanke;** Mrs J A Wilson, Mr Penn, Peter Collins, Mr G J Wilson, Susan Julyan, Eric Sida. **Showa;** Mrs J Coleman, Mr G J Wilson, Mr M James, Joe Wilmington, Neil Sanderson. **Utsurimono;** Mrs J A Wilson, Phil Adamson, Graham Langton, Susan Julyan, Eric Sida. **Bekko;** Neil Sanderson, Dave Scriven, David Wood, Mr D Watts, Mr M James, Neil Sanderson. **Tancho;** Mr and Mrs Keith Nind, Mrs J Coleman, John Byles, Mrs A Norbury, Phil Adamson. **Asagi / Shusui;** David Wood, Neil Cussins, Neil Sanderson, Grant Clifton, Graham Langton, Susan Julyan. **Koromo;** Mrs J A Wilson, Tony Brown, David Ford, Mr M James, Paul Jarrett, Grant Clifton. **GinRin;** Mrs G J Wilson, Mr Penn, Robert Wilmington, Neil Sanderson, Eric Sida, Mr M James.

Finally, congratulations to BKKS chairman **Tony McCann,** in his first year in this post, his show chairman **Graham Oldroyd,** and their teams of willing workers who put this highly successful show together which so many people enjoyed. My personal thanks to those exhibitors who entered their magnificent Koi. It is because of these people taking their fish, some the like of which we would not normally see, to shows such as the "National", that we get so much pleasure from attending them.

I understand that trade stands are already being booked for next year and that must be a good omen for 1993. I look forward to it and once again meeting more of those many people who are only voices at the end of a telephone. Further details of membership of the BKKS can be obtained by ringing the membership secretary, **Cliff Williams,** on **0702 616723.**

DAVID TWIGG

Show chairman Graham Oldroyd with some of his team of willing workers.

DAVID TWIGG

DAVID TWIGG

Far above, Grand Champion Showa entered by Joe Wilmington.

Above, Koi '92 in full swing. Luckily, the storm clouds held off!

JOHN DAVIS

Ferdie Dee (he's the one with the 'natural'(!) blue hair!) — the show's ever-popular entertainer — shares a word . . . or considerably more . . . with Billing's resident clowns.

# Koi Calendar

By David Twigg

## LATEST NEWS

The show season is almost over and we will have been left with memories of some lovely days out looking at wonderful selections of Koi. Koi shows give the ordinary Koi keeper a chance to see some of the best fish in the country.

The knowledge gleaned by talking to other Koi keepers and dealers alike is improving by leaps and bounds. Sharing experiences, good and bad, with other visitors, leads to the development of new ideas and the subsequent improvement of both the Koi in our ponds and the ponds they live in. New filter media for example, are always appearing and there is bound to be a difference in results obtained by people with differing systems.

The latest medium on the market is another sintered glass product called **Bio-Home.** This offers phenomenal surface area for the bacteria to grow upon. I have recently seen a sample of this medium, which comes in two sizes of small cylinder, rather than hoops, and either size can be purchased in two forms: Bio-Home, which is untreated, and **Bio-Home Plus,** which is impregnated with trace elements (magnesium and iron) which are supportive of anaerobic bacteria. I look forward to reporting further on this product. Further details can be obtained from **Ken Dakin** on **075 881 2820.**

In my first sentence, I said that the show season was **almost** over. This was because the 'ever-at-the-forefront-of-innovation' **Northern Section BKKS** are holding a **Winter Show** on **14 November.** This show, which is the brainchild of **Peter Waterman** and **Peter Waddington,** is to be an English-style Open Show, so if you wish to book a vat, please give **Tony McCann** a ring on the number quoted in the **Calendar** below. I will give more details of this show next month.

## JOBS FOR THE MONTH

This is the month when you will probably erect your winter cover. Please be careful not to disturb your fish too much in the process; a stressed fish is not what is wanted when feeding is reduced and we are about to enter the long British winter.

As feeding is reduced, consideration should also be given to reducing water flow through filter systems during the winter months. This is done to prevent further cooling of the water and to minimise the activity of the Koi during this period without food. A gradual slowing down of water flow and feeding must be undertaken in such a way that changes in water quality do not adversely affect the fish.

If not yet installed, it may be worth considering the installation of some form of water heating at this time of year. This will extend the feeding and growing season and the Koi will be that much more healthy when entering winter, and therefore much healthier and more able to resist all the opportunistic organisms just waiting for a host, when leaving.

I am writing this column in mid-August and what a month July has been. It was full of delight, counter-balanced by disaster. My youngest son graduated, and I lost all but a dozen of my 1-1½in fry.

I had wondered why, over a few days, the quantity of fry in my net which had numbered, I guess, a thousand, were depleting at a great rate of knots. When I came to 'vacc off' the header pool, which is the home of these fry, I had to move the floating net and this movement opened up a gap in the net, which had obviously been there for several days or even longer, and the remaining hundred or so fry also swam out.


You might think that this isn't too bad. Well it wouldn't be, if it were not for the waterfall which pulls the fry over and passes them on to the mouths of the waiting shoal below.

Therefore, only a dozen or so survivors remain and most of those are very dark. The moral of this story is that when sewing up new growing-on nets for the fry, ensure that **nylon** thread is used in preference to cotton.

## HOW KANG VISIT

But back to the pleasure. My wife and I drove down to Portsmouth for our son's graduation and, after attending the ceremony and having partaken of a good lunch, Giles took us to **How Kang Koi.**

How Hang Koi has recently moved into a suburb of Portsmouth and the business comprises a shop front, from where an extensive range of dry goods are sold, and several rooms behind which house vats full of a wide range of Koi varieties and sizes. Of particular interest to me in the dry goods area, was the excellent display of a wide variety of granite Japanese lanterns.

Passing through the rooms beyond takes you by vats full of super Koi ranging from 4-24in (10-60cm). In the large display pond at the farthest point, was a lovely selection of high-quality Koi from among which a smashing Showa really caught my eye.

I could have spent much more time talking to How and looking at his Koi, but as usual, time was short, so we had to move on. **How Kang Koi** are at **81 New Road East, Copnor, Portsmouth, Hampshire** and can be contacted on **0705 663812.**

## NEW CLUB

Another new Koi club has been notified this month. The **East Riding Section BKKS** has been formed and meets in Beverley on the first Monday of


DAVID TWIGG

**How Kang Koi — well worth a visit.**

DAVID TWIGG

**I was particularly impressed by the Japanese lanterns at How Kang Koi.**

every month in the evening.

This club, 33 strong already, is made up of Koi keepers old and new. Contact chairman **Rod Young** on the number in **Calendar** below for more details.

## SHOW REPORTS

1 4/5 **July** saw the **Central Section BKKS Show** take place where, I am told, "the quality of fish on display was excellent and the water quality remained stable over the weekend".

Major winners were **Pat Stevens** (Supreme Champion, Best Sanke and Best Lady), **Colin Stevens** (Best Showa), **Win Greenshill** (Best Kohaku), **Tony Carter** (Best Novice) and **Phillip Rogers** (Best Junior).

Other first prize winners were **Eileen Bowcott, Trevor Hunt, Tony Bowcott, Martin Lefevre, Don Rogers, Michael Rice, Andrew Glazzard, Ken Smith, Dave Greenshill, Des Sadler, Terry Whittington, Chris Fullerlove, John Thompson, Terry Venables, Colin Ward, Ray Green, Graham Jones** and **Cilla Lefevre.**

Well done to chairman, **Colin Stevens** and his team for a successful annual show.

2 My thanks to **George Rooney** of the **South Hants Section** of the **BKKS** for sending me details of their first Open Show on **26 July.** This proved to be a great success, with 139 Koi entered, of which 54 were 'open' entries.

Ten Koi dealers were in attendance, and **Bernice Brewster, Bill McGurk** and **Nishikigoi International** were there as well.

The team of judges, led by **Alan Rogers,** chose a magnificent Size 5 Showa, entered by **Grant Clifton,** as the Grand Champion. Grant also picked up the prize for Mature Champion with a Size 6 Koromo. The Adult Champion, a Size 4 Sanke, was entered by **Brin Phillips** of the Mid-Somerset Section; the Baby Champion, a Size 2 Kohaku, and entered by **K R Taylor,** and the best Tategoi, a Size 3 Sanke, came from **Terry Clark.** Well done to them all and to **Denis Carter** and **Luke Hagstrom** who were awarded Judging Standards Committee Special Merit Awards.

Other winners were **K Rose, P McGlyn, C Hutton, C Whitebread, W Batty, F Chalke, C Benford, R Heath, N Harnden, G Mortimer, B Cloke, G Rooney, A Whittenham, P Sutcliffe, S Pomery, D Greathead** and **P Bollen.**

Congratulations to chairman **Dave Collis** and his team for an excellent show which attracted over 1,200 visitors on the day.

DAVID TWIGG

**Grand Champion at the South Hants Section BKKS: Showa entered by Grant Clifton.**

## WHAT'S ON IN OCTOBER

1 — **Middlesex & Surrey Borders Section BKKS. Slide show** of members' ponds. Hampton Football Club. Contact **Joy Fraser** on 0737 844338.

**The Potteries & District Koi Keepers Society.** Guest speaker is **Chris Fullerlove.** 8 pm "The Biddulph Arms", Biddulph, Stoke-on-Trent. Contact **Graham Platt** on 0782 396670.

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

4 — **Northern Section BKKS Open Day.** Contact **Tony McCann** on 061 794 1958.

**Mid-Staffs Section BKKS. Local pool visit.** Contact **Don Dyche** on 0543 425178.

5 — **East Riding Section BKKS.** Speakers, with videos, are **Liz & Mike Donlan.** Contact **Rod Young** on 0428 866770 for further details of venue.

**Kennet Valley Section BKKS.** 8 pm at Newbury Rugby Club, Pinchington Lane, Newbury, Berks. Contact **Bob Thompson** on 0734 713640.

6 — **Yorkshire Section BKKS.** Holme Leas Inn, Ossett, Nr Wakefield. Contact **Fred Harston** on 0226 722578.

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

10 — **Heart of England Koi Society.** Warwick. Speaker is **Charles Harriss** of Purity on Tap. Contact **me** on 0926 495213.

11 — **Central Section BKKS.** T P Riley Community Centre, Bloxwich. Contact **Mike Higginbottom** on 0922 37682.

**Northern Section BKKS.** Speaking on *Pond Construction* is **Paul Jarrett.** St James Hall, Pendleton. Contact **Tony McCann** on 061 794 1958.

**Lea Valley & Harlow Section BKKS. AGM.** Contact **Barry Ford** on 0279 419101.

**Mid-Somerset Section BKKS.** 2 pm West Monkton Village Hall. Speaker is **Ashley Pope** of **BWG.** *My Trip to Israeli Koi Farms.* Contact **Alan Purnell** on 0458 72132.

12 — **Northants Section BKKS. Paul Stacey** talks on *Koi Treatment.* Casuals Rugby Club, Northampton. Contact **John Byles** on 0604 718648.

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

14 — **South Hants Section BKKS.** 8 pm Denmead Church Hall, Hambledon Road, Denmead, Hants. Contact **George Rooney** on 0420 473169.

**Merseyside Section BKKS.** I will discuss *Pond Planning.* Millbrook Manor Restaurant, Knowsley Village. Contact **Phil Adamson** on 051 220 2970.

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

21 — **Mid-Staffs Section BKKS.** RNA Club, Elmore Green Road, Bloxwich. 8 pm start. Contact **Don Dyche** on 0543 4251788.

25 — **Essex Section BKKS.** North Stifford Village Hall. Contact **Bobbie Barton** on 0702 611750 or **Margaret Bishop** on 0702 522388.

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

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

**Japanese Water Gardens Koi Auction.** Contact **JWG** on 0602 397926.

**Merseyside Section BKKS. Pond Open Day.** Five members' ponds open to view by other members. Contact **Phil Adamson** on 051 220 2970.

Details for Koi Calendar should be sent to David Twigg via *A & P.*

# Coldwater jottings

By Stephen J. Smith

## DEMISE OF THE VEILTAIL?

There was a time, not many years ago, when *the* quality Goldfish variety in the UK was undoubtedly the Veiltail. Now, the hobby has, apparently, progressed in leaps and bounds over the last decade or so, with new and exotic varieties of the species being introduced into the country from the Far East.

But what price the Butterfly, Hamanishiki, Jikin, and even the Chocolate and Blue Orandas, and the Moor? So rarely seen in even the most established retailers, is the Veiltail.

For me, one of the major attractions of the Goldfish is its blood-orange colouring: you really cannot get better than a good quality so-called Common (or Ancestral) Goldfish. Unless, maybe, it is a Veiltail.

A good Veiltail, with proper 'broadtailed' finnage, is a sight to behold. Or was. . . .

So where are they? Doubtless, a few specialist breeders will still be producing the Veiltail in all its glory, but this most attractive variety must not be solely the preserve of the most dedicated Goldfish keepers.

Hopefully, some Veiltails will be seen on the show-benches of the specialist Goldfish shows up and down the country this autumn. While there is a place for each and every one of the one or two hundred varieties of Fancy Goldfish which purport to exist, let's still keep a special place for the Veiltail.

## POND HOOPS PRIZE


As the warmth of the summer subsides towards the end of the pondkeeping season, so the nutritional requirements of fish change to prepare them for the onset of the winter. To meet these requirements, aquatic products manufacturer **Interpet** has devised a food which specifically caters for the seasonal requirements of pond fish.

According to Interpet, the company has conducted extensive research and field trials to develop a range of Koi and pond fish foods which take into account the digestive and nutritional requirements of pond and ornamental fish, including Koi, Goldfish, Orfe, Rudd and Tench.

"The characteristic hoop shape is also the result of precise research," explained Interpet's managing director, **Mark Senior.** "Hoops have a high ratio of surface area to volume, ensuring quick wetting and increased digestibility, as well as being highly acceptable to fish, which prefer food items with a diameter equal to their length."

To celebrate the success of the range of Koi and pond foods, the company is providing the opportunity for **20 winners** to each receive a six-litre pack of either **Three Seasons Pond Food,** or **Koi Spring/Autumn Food.**

All you have to do is to answer the following three questions, and send your answers, together with your full name and address, to: **Interpet Hoops Competition, Coldwater Jottings, Aquarist & Pondkeeper, 9 Tufton Street, Ashford, Kent TN23 1QN.** Closing date is **30 October 1992.** Please indicate whether you would prefer to receive **Three Seasons Pond Food** or **Koi Spring/Autumn Food.**

1. What is the name of the fishkeeping founder and chairman of Interpet?
2. In Koi, Goldfish, and other cyprinids, does digestion take place in the stomach or the gut of the fish?
3. What is the name of the distinctive shape of Interpet's **Three Seasons Pond Food, Koi Summer Food** and **Koi Spring/Autumn Food?**

## INDOOR WINTERING FOR KOI?

**Alan Stewart,** of Ardrishaig, Argyll, is seeking advice on overwintering his collection of Koi.

He has a 4,500-gallon (c 20,500-litre) pond which accommodates a treasured collection of Japanese Koi, and explains: "What type of set-up would be good for my fish over the winter? I would like to bring them into shelter and I have room enough at the bottom of my garden for a shed. What size can I get my holding tank down to?".

My own feelings about overwintering Koi, and even my own Fancy Goldfish, is that some experience of a winter do them more good than harm. Naturally, the fish need to be protected from the severe extremes of the winter season, but, happily, we have been spared a 'bad one' over recent years.

Therefore, I would prefer to keep my fish outdoors in their ponds over the winter. Pond covers made from greenhouse polythene stretched over timber frames have been effective in keeping frosts at bay. A further expedient is to ensure that the pond itself is of sufficient depth to maintain the fish throughout the winter.

Alan's pond is 5ft (1.5m) deep at its deepest and, in my opinion, the deeper a Koi pond is, then the better it is for overwintering Koi. I am myself, in the throes of completing a pond which is 6ft (1.8m) deep, and I am aware of many Koi pools as deep as 8ft (2.4m)!

However, as a rough guide, a depth of 3ft (90cm) minimum would be sufficient for the fish to be protected from the worst of the winter cold in the UK. Please make sure that the pond is clean and that all detritus and debris is removed, as well as plants pruned to remove dead leaves, before the onset of the first frosts. Then, repeat the process at the beginning of spring.

Regular readers of these columns will be familiar with my own twice-yearly regime when wellies are donned every spring and autumn, and the pool is emptied and given a thorough scrub with *clean* water (no detergents, please!).

Many Koi keepers actually heat the water in their Koi ponds throughout the winter, partly, I would imagine, to enable continued growth. However, I feel that fish which have endured a winter experience will be better at spawning time, so my best brood fish are brought into indoor accommodation during January, before the onset of the worst of the cold weather, when they will have had a period of semi-hibernation. These fish can then be conditioned for a healthy early spawning.

To return to Alan Stewart's questions, what methods do readers employ, if any, for overwintering their coldwater fish? Please let us know, as soon as possible, and we can include your ideas in a future **Jottings,** hopefully before the winter.

# Trade Talk

## Concerns over Purity

**Charles Harriss,** proprietor of **Purity on Tap Limited,** has expressed concern over the use of his company's name on products which have not come from his company.

Explained Charles, "Purity on Tap has been made aware that, in the Manchester area in particular, and in certain other quarters, 'look-alike' filtration systems, possibly carrying the legend 'Purity on Tap', but without either logo or instructions, are being promoted as being our products.

"We wish to state that such units carry none of our guarantees, have not been subject to the same testing protocols, and therefore may not perform as ours are designed to. Simply, if it doesn't carry our logo stickers or come with our instructions, then it is not our product."

**Purity on Tap, Wickfield Farmhouse, Shefford Woodlands, Newbury, Berks RG16 7AL. Tel: 0488 648319 (Helpline); 0831 843 402 (Mobile); Fax: 0488 648997.**

## New Tropical Fish From Bach Aquatics

Fancy fish specialist **Bach Aquatics** is offering tropical fish selections for the first time this winter.

Bach's tropical ranges will include varieties such as Angelfish, Swordtails, Platies, Mollies and African cichlids. According to the company, they have all been selected according to the same rigorous quality standards which are a feature of Bach's existing coldwater pond and aquarium lines, and adds Singapore to the company's network of selected suppliers in Israel, Germany, USA and China.

"Existing delivery services are available from the company for all new lines of tropical fish," explained a spokesman. "These will be available from our headquarters at Stokes Poges and our two northern distribution outlets, **K G Products** in the Midlands and north-west, and **Belle Vue Koi** in the north-east."

Bach Aquatics boast a guaranteed overnight delivery service for orders placed before 3 pm, Monday to Wednesday; while orders for the weekend, placed before 10 am on Thursday, can be dispatched overnight.

**Bach Aquatics Ltd, Stoke Place Farm, Stoke Road, Stoke Poges, Bucks SL2 4NL.**

## Pet Food Industry Rides Out Recession

The volume of the pet food market remained stable throughout 1991, according to the **Pet Food Manufacturers Association.** Sales amounted to over 1.4 million tonnes, with a retail value of almost £1,200m.

According to a PFMA spokesman: "Pet food has continued to become better value for money with inflation rates again below the retail price index.

"The stable volume of the market reflects the fact that pet populations have remained steady over the last year. In 1991 there were 7.3 million dogs, 6.9 million cats, 17.4 million Goldfish, 12.3 million tropical fish, and 170,000 marine fish."

## New Management for OFI

With the retirement of **Jack Ruijsbroek** as President, **Ornamental Fish International (OFI)** has seen the return of leadership to Great Britain.

Reorganisation within OFI has resulted in the dissolution of the Board of Directors, replacing it with a management team headed by two joint managers. The new managers are **Mick Seaby,** Managing Director of Swallow Aquatics Limited, a large retail outlet in Rayleigh, Essex and **Peter Golding,** the Managing Director of Peter Golding Limited, the wholesale aquatic distributors from Barton Stacey, Winchester.

The main effect of the reorganisation will see a shift of emphasis from political aspects to business concerns, together with the production of a new quarterly journal. The journal will have editorial content from contributors throughout the world and also contain a constantly updated list of members. The distribution will be handled by OFI branch offices and will be supplied without charge to members, airlines, government departments and embassies.

The next conference under the new management will be held in Sri Lanka. The decision to visit Sri Lanka was the result of an excellent presentation at the Nurenburg meeting by **Mr Vibhu Perera,** the proprietor of Lumbini Aquaria. Prior to the meeting, Mr Perera had secured the backing of his government and national airline, **Air Lanka,** to subsidise the travel and hotel accommodation for all delegates. This opportunity could obviously not be overlooked and, as a result, the Sri Lanka conference will open on 15 **November 1992.** An extensive programme has been produced, comprising of open meetings, lectures, field trips and a visit to Expo '92 in Colombo.

**Mick Seaby.**

**Peter Golding.**

This conference has to be one of the most exciting programmes offered by OFI, and all members are welcome. But it will not stop there; arrangements for the following two conferences are already in hand. Interested?

Details of membership and the conference programme are available from:

① **OFI Secretariat,**
**Frans van der Kolk,**
**BDC Marketing Services,**
**PO Box 23211,**
**3001 KE Rotterdam,**
**Holland.**
**Tel: 0103110 4363337**
**Fax: 0103110 4364507**

② **Mick Seaby,**
**Swallow Aquatics Limited,**
**London Road,**
**Rayleigh,**
**Essex SS6 9ES.**
**Tel: 0268 781265**
**Fax: 0268 782334**

③ **Peter Golding,**
**Peter Golding Limited,**
**Barton Stacey,**
**Winchester,**
**Hants SO21 3QL.**
**Tel: 0962 760792**
**Fax: 0962 760692**

## New S.A. Ornamental Fish Body

A national ornamental fish trader and producer organisation is being established by the **OFT (Ornamental Fish Trade)** section of the **Aquaculture Association of South Africa (AASA).**

**Servaas de Kock,** OFT project co-ordinator, is keen to provide an organised and represented structure for the ornamental fish industry in South Africa, and to support and encourage the large body of the country's small breeders to become larger and permanent providers of employment.

Remarked Servaas: "Since the AASA is now formally constituted and has won the recognition it has sought from the South African government, it now has to start work on reaching its objectives, which are to represent all producer organisations in the country."

He continued: "AASA has

recognised the trade and production of ornamental fish as an important aquaculture activity with great potential for the region. While the ornamental fish trade is highly-organised, formally, towards marketing its product from a few large importers and a large group of small producers, it is essential that it organises itself as a single representative body".

The AASA was formally constituted in 1990, following a proposal at the 1988 Aquaculture Symposium, to represent the interests of the South African aquaculture community, with the main objective of promoting the interests of aquaculture in South Africa.

Further information is available from **Servaas de Kock, Aquaculture Association of South Africa, PO Box 72467. Lynnwood Ridge, Pretoria 0040, South Africa. Tel: 011 315 1002; Fax: 011 476 4245.**

## New Packaging For King British Pond Fish Foods

**King British** has repackaged two of its floating fish foods, Pond Chips and Pond Pellets, following the repackaging of Goldfish and Tropical Flake, with a striking pack design featuring printed lids and colourful new labels.

**Keith Barraclough,** managing director of King British, said, "Over the past few months we have invested heavily in re-presenting our top-selling range of fish foods. We have an increasing share of the market sector and intend to build on this success by being innovative in our business. Retailers stocking these popular products in these updated packs can benefit through achieving quicker sales turnover and resultant higher profitability."

**King British, Hayecliffe Lane, Bradford BD5 9ET West Yorkshire. Tel: 0274 573551; Fax: 0274 521245.**


KING BRITISH

**King British ranges of Pond Chips and Pond Pellets have been re-presented in a redesigned pack, providing distinct on-shelf impact.**

## Cathy the Cliff-builder!

Twenty-six-year-old Wyke Regis woman **Cathy Smith,** could never have guessed that, when she took her BA degree in Fine Art, it would lead to a career which involves building artificial cliffs and even underwater rock falls.

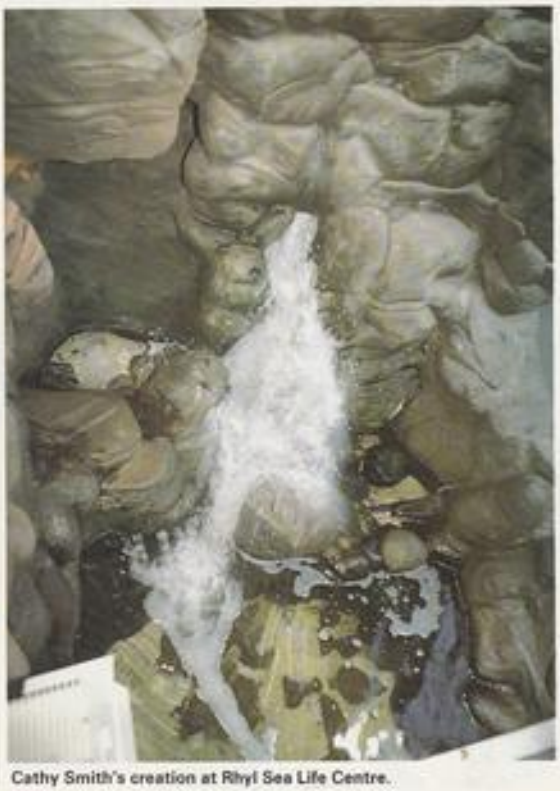
Cathy has become principal 'themer' for Weymouth-based **Sea Life Centre Technical Limited,** which installs the diverse fish tanks in Sea Life Centres and other European public aquaria, and she has been charged with the onerous task of creating the backdrops within, and sometimes outside, those displays.

Some of these projects have been the most challenging assignments she has ever faced: at the recently-completed **Rhyl Sea Life Centre,** Cathy and her team of assistants constructed a 30ft x 20ft (c 9 x 6m) cliff face from which a waterfall plunges into a deep tank filled with shoal fish, including Bass and Bream.

Also at Rhyl, she designed and built a backdrop for a large 'wave tank'. The construction was inspired by the famous 'Giant's Causeway' and thus comprises dozens of interlinked polygon columns.

Cathy and her team meanwhile, have transformed the bare-walled dolphinarium at Brighton, into a stunningly realistic underwater cavern, with replica rockwork and dark crevices. The cavern forms Britain's biggest fish-tank, through which the new Brighton Sea Life Centre underwater tunnel now runs, this being the longest underwater tunnel in Europe.

Admitted Cathy, "Trying to reproduce the natural environment of the seabed can be a challenging task, but the satisfaction of completing huge effects, such as the cliff-face at Rhyl, is tremendous".



SEA LIFE CENTRES

**Cathy Smith's creation at Rhyl Sea Life Centre.**

**Sea Life Centre (Holdings) Ltd, 17 Cobham Road, Ferndown, Wimborne, Dorset BH21 7PE. Tel: 0202 896289; Fax: 0202 896049.**

## Water Treatment Consultancy Launched

**Aquarius 2000,** a consultancy specialising in providing objective advice on water treatment, recycling and purification, has been launched by former operations control engineer **Bernard Edwards,** from Thornton Cleveleys, Lancashire.

"Methods of using water commercially are changing drastically," explained Bernard, who has 25 years' experience in various aspects of manufacturing and operations control.

"Much of the consultation taken for granted before the privatisation of the regional water boards is now only available through private regional water companies and the costs are considerably higher. In addition, existing methods are becoming increasingly complex, with so many influences: directives from health authorities, Westminster and the EC; scrutiny by environmental lobby groups; new technology; and an overwhelming desire by today's public to ensure that everyone in business complies with, not just the letter, but also the spirit of the law".

He concluded, "Even the ancient Greeks and Romans understood the need for water treatment, using filtration, ceramics, gravel beds and sand to improve water quality".

According to Bernard, he has already faced daunting challenges: in addition to experience in the newest methods of water treatment for Koi and other ornamental fish, he has been involved with creating and introducing a new product to challenge the bottled mineral water market, designing and producing a survival kit at the request of the Hungarian Armed Forces, and being responsible for the mechanical inspection of nuclear reactors at Heysham power station.

**Aquarius 2000** can be contacted by telephoning **Bernard Edwards,** on **0253 867141** or **J Lee Ready** at **PR One, 2nd Floor, Derby House, Winkley Square, Preston PR1 3JJ. Tel: 0772 53205; Fax: 0772 57059.**

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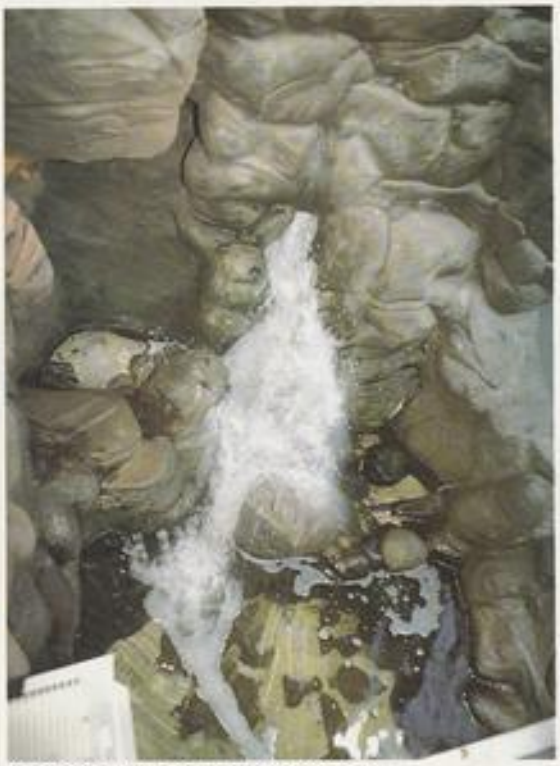
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**Aquarius 2000,** a consultancy specialising in providing objective advice on water treatment, recycling and purification, has been launched by former operations control engineer **Bernard Edwards,** from Thornton Cleveleys, Lancashire.

"Methods of using water commercially are changing drastically," explained Bernard, who has 25 years' experience in various aspects of manufacturing and operations control.

"Much of the consultation taken for granted before the privatisation of the regional water boards is now only available through private regional water companies and the costs are considerably higher. In addition, existing methods are becoming increasingly complex, with so many influences: directives from health authorities, Westminster and the EC; scrutiny by environmental lobby groups; new technology; and an overwhelming desire by today's public to ensure that everyone in business complies with, not just the letter, but also the spirit of the law".

He concluded, "Even the ancient Greeks and Romans understood the need for water treatment, using filtration, ceramics, gravel beds and sand to improve water quality".

According to Bernard, he has already faced daunting challenges: in addition to experience in the newest methods of water treatment for Koi and other ornamental fish, he has been involved with creating and introducing a new product to challenge the bottled mineral water market, designing and producing a survival kit at the request of the Hungarian Armed Forces, and being responsible for the mechanical inspection of nuclear reactors at Heysham power station.

**Aquarius 2000** can be contacted by telephoning **Bernard Edwards,** on **0253 867141** or **J Lee Ready** at **PR One, 2nd Floor, Derby House, Winkley Square, Preston PR1 3JJ. Tel: 0772 53205; Fax: 0772 57059.**

# Diary dates

## Sunday 4 October

**Halifax Aquarist Society:** The Open Show and Auction will be held at Forest Cottage Community Centre, Cousin Lane, Ovenden, Halifax. Booking in: 11.30 am to 12.45 pm. Judging: 1 pm. Full details from **David Shields** on 0422 360116.

**Ipswich and District AS:** The East of England Fishkeeping Show will be hosted by Ipswich and DAS at the Ipswich International Community Centre (Ipswich Caribbean Association), Woodbridge Road, Ipswich, between noon and 6 pm.

In addition to hundreds of fish from all over the country, there will be trade stands, a licensed bar, help on all aspects of aquatics, and displays of Koi, ponds, snakes and other reptiles.

For entry forms ring **Ray** on 0473 713037, or for more information, ring **Adrian** on 0473 611148.

## Saturday 10 October

**British Cichlid Association:** The BCA Annual General Meeting will be held at the Baptist Church Hall, Belmont Road, Bennetts End, Hemel Hempstead, Herts, at a time to be arranged. Contact **Mrs Lynn Fern,** BCA Secretary, 5 Winding Shot, Hemel Hempstead, Herts HP1 3QQ, for further details.

## Sunday 11 October

**British Cichlid Association:** The BCA will be holding its 1992 Convention at The Cavendish School, Warners End Road, Warners End, Hemel Hempstead, Herts (doors open at 10.30 am). Tickets (price yet to be fixed) will be available at the door. Guest speakers: **Stuart Grant** (exporter of fish from Lake Malawi) and **Dr Paul Loiselle** (author of several books — and aquarist from the US). There will also be a fish auction on the day. For full details, contact **Mrs Lynn Fern,** BCA Secretary, 5 Winding Shot, Hemel Hempstead, Herts HP1 3QQ.

**Preston & D.A.S.:** For details of the Auction — to be held at The Students Union, Lancashire Polytechnic, Fylde Road, Preston — please contact the P.D.A.S. Secretary **H E Virco,** 68 Norris Street, Preston, Lancs PR1 7QA.

**Kent Association of Aquarist Societies:** This will be the first-ever show held by KASS, to whom we extend our very best wishes. Full details of venue and times are available from **Avis Hayward,** 53 West Lea, Deal, Kent CT14 6TJ.

## Sunday 18 October

**West Cornwall Fishkeepers:** This year, the WCF's traditionally successful Open Show (held in Camborne) will be staged in conjunction with an Inter-Club Show — a popular event in which all the clubs from Cornwall and Devon participate. For further details, contact the Secretary, **Bob Williams,** Parc Cottage, Park Lane, Camborne, Cornwall. Tel: Camborne 717971.

**Tamworth and District AS:** The 1992 Open Show of this A of A affiliated society will feature the **A of A Superbowl Final.** Venue: Birch Coppice Miners' Club, Dordon. Details from **Gordon Davis,** 20 Tame Bank, Kingsbury. Tel: 0827 874911.

## Monday 19 October

**Reigate and Redhill A.S.:** Bring-and-Buy sale at Strawson Hall, Albert Road, Surrey. Doors open: 7.30 pm. Sale starts at 8 pm, with refreshments at about 9.30 pm. Non-club members welcome. Further details from the P.R.O., **Jeremy Spence,** 60 Railey Road, Northgate, Crawley, West Sussex RH10 2BZ.

## Saturday 24 October

**Northern Goldfish & Pondkeepers' Society:** The Open Show will be staged at the United Reform Church, Altrincham. Full details are available from the Show Secretary, **Alan Ratcliffe,** 2 Borrowdale Close, Burnley.

N.G.P.S. meets on the second Tuesday of each month at the Sports Centre, Silverwell Street, Bolton, at 7.45 pm. Subscription rates: £7.50 (single); £10 (family). Postal members are welcome. Contact **Craig Platt,** 6 Downs Drive, Timperly, Cheshire.

**Ilford and District Aquarists' and Pondkeepers' Society:** The Ilford Annual Exhibition (N.B. this is *not* an Open Show) will be held at Saint John's Parish Church, Wanstead High Road, Wanstead, Essex, from 11 am to 5 pm. For further information, contact **R Downer,** 5 Suffolk Drive, Laindon, Basildon, Essex SS15 PL.

## Saturday 24/Sunday 25 October

**Deutsche Cichliden-Gesellschaft E.V. (German Cichlid Association):** The Nederheim division of the German Cichlid Association will be holding its 1992 exhibition at Heinrich Böll Gesamstschule, Dudeler/Ecke Neuköllner Strasse, 4200 Oberhausen Schmachtendorf, Germany.

Lectures will be presented on Tanganyikan, Malawian, Central and South American Cichlids, as well as on fishkeeping restrictions within the EC by **Heinz Büscher, Gerd Eggers, Bernd Kilian** and **Ad Konings.**

Local and international cichlid dealers will be present on both days. There will also be an exhibition of aquaria set up by members of the Association.

Further details of, both the exhibition and hotel availability, are available from **Beate Schulz,** Markstr. 19, 4100 Duisburg 12, Germany. Tel: 0203 4434297.

## Sunday 1 November

**Portsmouth Reptile and Amphibian Society:** The PRAS will be hosting their first Annual Reptile Fayre at Brookfield School, Brook Lane, Lochs Heath, Hants (just off the A27 between Portsmouth and Southampton). Opening hours: 10.30 am to 4.30 pm. There will be a display of reptiles, amphibians and invertebrates, with opportunities to purchase animals and accessories. Further details are available from **Jon Hollingsworth,** 39 Wykeham Field, Wickham, Fareham, Hants PO17 5AD. Tel: 0329 833017.

# News from the societies

## St Neots & District Aquarist Society

We have been approached by the secretary of St N & DAS, which is currently in the process of being formed, with a request to bring the society to the attention of any *A & P* readers who may be interested in joining or helping during these crucial initial stages.

If you live in the area, or can offer some assistance ... or would wish to become a member, please contact **Sandra Nicholas,** 87 Hampden Way, Eynesbury, St Neots, Cambs PE19 2JH. Tel: 0480 212954.

We, at *A & P*, wish Sandra and her committee great success in their new venture and look forward to receiving further news in due course.

**SUBMISSIONS FOR DIARY DATES**

TO ENSURE THAT YOUR SOCIETY IS FEATURED IN DIARY DATES, PLEASE LET US HAVE ALL THE NECESSARY DETAILS AT LEAST EIGHT WEEKS BEFORE THE PUBLICATION DATE OF THE ISSUE IN WHICH YOU WOULD LIKE YOUR EVENT TO BE PUBLISHED.

# GOING TO GREAT

*A & P* editor, **John Dawes,** reports on Ocean Nutrition, a Californian manufacturer of innovative quality frozen foods for marine and freshwater fish . . . and invertebrates.

*Photographs by the author*

It all started with an advertisement in *A & P*. It was, I thought, a really classy-looking full-page colour ad for deep-frozen fish and invert foods. It carried neither gaudy headlines nor brash colours. It just projected an aura of 'controlled' impressive excellence about it that beautifully conveyed the freshness and natural origins of selected items from the range. The page was then perfectly topped by the statement: "We Go To Great Depths For The Best".

This wasn't my first encounter with Ocean Nutrition foods, though. I had been familiar with them for some time, and had long been convinced of their high quality. The ravenous way in which they were accepted by their 'ultimate consumers and judges' . . . the fish themselves . . . spoke volumes.

Then came what has turned out to be a major breakthrough in the marine hobby: the introduction of a sponge-containing **'Angel Formula'** which, in one stroke of genius, made the keeping of a wide range of marine Angels and Butterflies the realistic proposition that marine aquarists had been dreaming of for years (see, for example, **Gordon Kay's** comments in **Seaview** — August '91, p 10 — although we got our facts slightly mixed up: Ocean Nutrition has no connection with Aquarium Systems . . . or anybody else for that matter).

We were discussing all this with **Chris** and **Carol Turk** (President and Vice-President of Ocean Nutrition) at PetIndex in April of this year, where they were exhibiting on the Underworld Products stand (Underworld is the sole UK agent for both Ocean Nutrition and Aquarium Systems products). During the course of the conversation, Vivian — my wife — had suggested that perhaps we should do a slightly longer piece on the range than we had done in **Seaview**. One thing leads to another (or so they tell me!), and before we had time to say *Pomacanthus imperator* backwards, we had arranged a visit to the Ocean Nutrition headquarters in San Diego, California.

## FRESHNESS AT ITS BEST

Ever since my childhood days, I've been enthralled by visits to factories. I've always loved seeing how individual ingredients or components are mixed or assembled to end up — almost magically — as products that somehow always seem to possess more qualities than the mere sum total of those of the component parts. It was therefore with great expectations that I looked forward to my close encounters with the Ocean Nutrition fish foods.

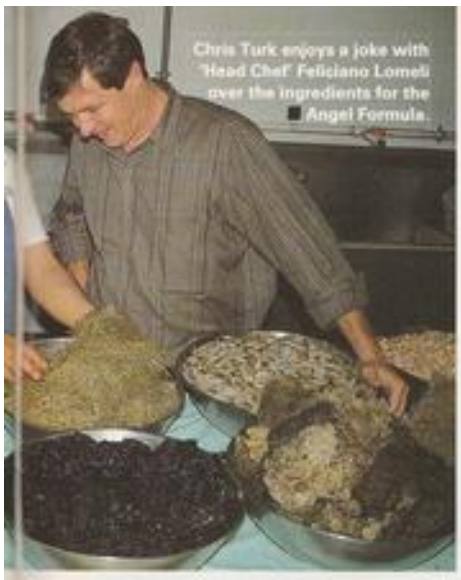
I was not to be disappointed. In fact, the reality far exceeded my expectations, high though these were.

From the moment you step into the factory, the freshness of the products hits you (figuratively speaking, of course). Were it not for the presence of a deep-freeze

Part of the production line during the filling and freezing (note the freezer tunnel) of one of the 'formula' foods.


Ocean Nutrition's office and manufacturing unit photographed from the forecourt of the shipping and receiving warehouse.

Ad Konings' 'Cichlid Vegi Formula' flat-paks coming out of the freezer tunnel.



Chris Turk enjoys a joke with 'Head Chef' Feliciano Lomeli over the ingredients for the ■ Angel Formula.

How much fresher can you get? Newly mixed ingredients just prior to mincing.

The two sponges used in the Angel Formula are both very abundant in their native waters where they are grazed by a large number of Marine Angel species.

tunnel, other freezers, assorted blenders, mountains of polythene bags, 'cube' packages, stacks of labels, fork-lift trucks and the like . . . plus the absence of waiters, tables and chairs, you could just as well be in a top class seafood restaurant. Such is the overwhelming aroma of fresh shrimps, prawns, scallops, mussels, and other assorted goodies that, before you know it, automatic biological reflex actions unconsciously slip into gear and you start feeling awfully hungry!

Being taken on a tour of the raw ingredients doesn't help either. I found myself having to resist the temptation to reach out and pluck a nice juicy prawn while no one was looking. Even the two species of sponge which go to form part of the afore-mentioned Angel Formula looked appetising! Actually, the quality of these raw ingredients is such that they are, quite genuinely, fit for human consumption (though I wouldn't think that I'd relish digging into a bowl of bloodworms, glassworm or raw beef heart!).

## COMMENDABLE APPROACH

Cleanliness, freshness and total dedication to producing a top-rate array of foods are everywhere you look. Here is a company that has firmly set its sights extremely high and has gone for its targets with verve and professionalism, while (highly commendably) still maintaining a tremendously friendly, co-operative — and therefore highly productive — atmosphere that encourages a positive approach from the whole workforce.

I like that. I like it a lot, in fact. It always pleases me enormously when I see successful commercial enterprises functioning with dignity and respect for the individual. I got the distinct impression, not just from Chris and Carol Turk, but also from everyone else (and I spoke to most of the 25 or so members of staff) that Ocean Nutrition is certainly a happy and good company to work for.

Being so close to Mexico (which is no further than a long taco-throw away!), most of the staff are Mexican. Carol, who is of Spanish-Mexican extraction, speaks perfect Spanish, of course. Her father, **Frank Acuña,** with whom both Vivian and I enjoyed some very long, lovely chats arrived in Mexico (from Spain) before world war two and later moved to San Diego. He now works at Ocean Nutrition as well.

Chris, for his part, has learned Spanish over the years and can discuss any and every aspect of production in minute detail with his staff, so there is no obstacle of any kind when it comes to running the whole operation. (Chris is also an expert hand at haggling over the price of all manner of goods down the road in Tijuana, but that, as they say, is another story!).

## THE TEAM

**Chris Turk** has been interested in fish all his life. By the time he was twelve, he was already collecting tropicals in his native Florida. In 1972, he graduated with a degree in marine ecology from Dartmouth College, shortly followed by Masters research in fisheries biology at the University of South Florida (where, incidentally, I've seen some great Sheepshead Killies and Sailfin Mollies in a tiny stream in the university gardens . . . absolutely fantastic!).

He spent over ten years on aquaculture projects, later moving on to head the Clownfish captive-breeding programme at San Diego's Sea World. It was there that he met **Carol** and **Larry Fine** (who is now the National Sales Manager for Ocean Nutrition and who arranged a superb behind-the-scenes visit to the marine aquarium there). It was also at Sea World that the foundations for the current foods began to take shape, with the production of a formula that was good enough to culture hundreds of thousands of Clownfish, Jawfish, Gobies (largely, Neons) and that amazingly-orange temperate Damsel, the Garibaldi.

Two other key figures are the almost-

# FOR THE BEST DEPTHS

continually-on-the-go **Brad Ozenbaugh,** who is the Shipping and Warehouse Manager, and the man I would choose to call the Head Chef: the delightful, charming **Feliciano Lomeli,** otherwise officially known as the Food Production Manager. Feliciano couldn't believe his luck when he discovered that, having been born in Gibraltar, both Vivian and I spoke fluent Spanish.

What a great guy he turned out to be! No effort was too great, and it is a direct tribute to him that we learned so much — so quickly — about the delicately balanced science (or is it art?) of the food production process.

**Efficient (and highly effective) insulation at the packing stage ensures that the foods will still be fully frozen on arrival at their destination. These are Krill, Clam and Squid Aqua-Yums minutes before shipping.**

Keeping the whole operation running smoothly are book-keeper **Sonia Vales,** and **Beth Terhaar** who handles the incoming orders and processes the shipments. Both carry out their responsibilities with a great 'sunny disposition' that perfectly mirrors the equally pleasant Californian weather we experienced during our unforgettable visit.

With such a good team, your chances of success are, obviously, enhanced, but behind it all, must lie the all-important question of the quality of your product.

## THE FOODS

Here is a list of ingredients: Brine Shrimp, Krill (*Euphausia superba* and *E. pacifica*), Squid, Shrimp, Mussel, Clam, Sea Urchin, Zooplankton (*Calanus*), Glassworms, Bloodworms, Silversides, Fish Roe, Green and Brown Algae (*Ulva, Caulerpa, Hypnea*), Sponges (two species, both very abundant in Florida waters, but whose identity is being kept secret by the collector), Beef Heart, Beef Liver, Spinach, Romaine Lettuce, Banana, Zucchini, Wheat Germ, *Spirulina* and Canthaxanthin (natural pigment enhancers), Vitamins, Amino Acids, Trace Elements, Gelatine or Alginate binders. . . .

Impressive isn't it (?), particularly when you consider that some foods can contain seven or eight added vitamins, six or so trace elements and a judicious selection of amino acids. Not every food contains every ingredient, of course. Were that to be the case, then every formula would be exactly the same, and this is very markedly *not* so. Each formula has been thoroughly researched and tried out, and each is based on intimate knowledge of the species for which it is intended, and their nutritional requirements.

For example, the two sponges used in the Angel Formula are both species which the collector has, over several years, identified as abundant and has regularly witnessed being grazed by Angels in the wild. If, given such free choice of food items, a fish consistently selects one or two in preference to the others, then what better proof can there be regarding their suitability as viable components of a formula?

It might be worth making the point here that the sponge species concerned occur in great numbers in their natural Florida waters. In addition, the quantities used in the Angel Formula probably account for around 10% of the total weight of ingredients (and do not represent a great volume overall). In other words, there is absolutely no danger of upsetting the delicate balance of reef life through over-collection (a very valid query that Gordon Kay raised in his August '91 item). So, the Angel Formula is not just a great food, but it is also put together with the environment very much in mind.

Mention the name **Jack Wattley** and every serious hobbyist knows that we are talking about one of the genuine giants (and a very pleasant guy he is, too!) of the Discus world. If, therefore, Jack were to be intimately involved in the production of a fish food, you'd have to take that food seriously. Well, this is precisely what's happened with Ocean Nutrition's **Discus Formula** and **Fry Formula.**

Similar involvement by two other well-known figures have led to two **Ad Konings' Cichlid Formulae** and two from **Heiko Bleher (Community** and **Conditioning Formulae).** These six specialised formulae comprise the new **'Professional Signature Series'** for freshwater fishes.

Overall, there thirteen 'formula' foods, including, in addition to the above, such desirable items as **Invert Food, Brine Shrimp Plus, Prime Reef, Formula One** and **Two** (with freshwater counterparts) and a high-protein recipe: **Formula VHP,** which is claimed to contain the highest protein content of any frozen fish food on the market. These foods are available in a number of forms, e.g. medium cubes, large cubes, jumbo cubes, flat 'paks', etc, so by the time you add up all the various permutations, there are about 80 different lines.

Then there are the **Aqua-Yums,** consisting of single ingredients, such as shrimp, squid, mussel, krill, sea urchin (a superlative food for Triggerfish), prawn, bloodworms, clams, and others. Altogether, there are over 35 different lines in the Aqua-Yums range.

Other products include **Vit-A-Boost** (dry foods for both marine and freshwater use), **Pro 1000 Dry Foods,** and a great little invention: transparent **feeding sticks** with which you can dangle a morsel of food in front of a difficult feeder without the fish being able to detect the stick. This reduces stress levels and, consequently, improves the chances of the fish in question beginning to eat in captivity. This is a great 'neat' invention that seems to encapsulate Ocean Nutrition's observant, well-informed, and caring approach to the whole subject of feeding fish in aquaria.

## CLOSING THOUGHTS

We left Ocean Nutrition feeling that we had visited a very special place. We also learned a great deal about fish diets and the complex skills required to produce foods of high quality successfully in a friendly, open working atmosphere.

You don't have to be nice to succeed in business, but when you are both successful *and* nice, to me, that's an unbeatable combination. Ocean Nutrition have been proving this for about eleven years now. I wish them the very best for the rest of the decade . . . and hope that they'll continue to go from strength to strength well into the 21st century. A&P


## ACKNOWLEDGEMENTS

I would like to extend sincere thanks to **Chris** and **Carol Turk, Feliciano Lomeli, Larry Fine, Brad Ozenbaugh, Sonia Vale, Beth Terhaar** and **Señor Frank Acuña,** all of Ocean Nutrition, for their kind and generous hospitality and their willingness to answer my constant stream of (often awkward) questions.

I am also grateful to **Carl Jantsch,** Assistant Curator of Fishes at Sea World, for his valuable time and fascinating insights (with a bit of luck, we'll even get him to write a feature for *A & P*).

On a different 'aquatic note', **Ray Keyes** (formerly Curator of Fishes at Sea World, San Diego) did me the great honour of showing me around the incredible 14-pond system of wildfowl and Koi ponds he has installed at the **Meridien Hotel,** and the mind-boggling tropical marine pools he runs at **Peohe's Restaurant.** He also showed me his own Koi pool and that of one of the US's leading Koi enthusiasts, **Gale Hansen** — a memorable experience indeed.

Finally, **Franco Acuña** provided an unbelievable experience by taking us 'backstage' at San Diego Zoo to see the big cats at *really* close quarters. From a distance, a lion looks big . . . from six inches away, it's ginormous . . . and those eyes . . . well, they are something else!


## OCEAN NUTRITION IN THE UK

The sole UK agent for the complete Ocean Nutrition range is **Underworld Products, Units 1 & 2 Belton Road West, Loughborough, Leicestershire LE11 0TR. Tel: 0509 610310; Fax: 0509 610304.** Contact: **Dave Keeley.**

# PRODUCT ROUND-UP

BY DICK MILLS

## UV Systems

If you've yet to join the Ultraviolet users' ranks, don't despair and go thinking that you've got to buy a whole new filtration system; you haven't.

The new compact and attractive CLEARMASTER 4 WATER PURIFYING UNIT from **UVA SYSTEMS** may be the smallest in the Clearmaster range, but its performance is no less efficient for all that, and it will maintain excellent water clarity in even the smallest ponds and aquariums.

UV SYSTEMS LTD

UV purifiers efficiently destroy bacteria and moulds, and control algae without any unpleasant effects on fish or other aquatic life.

Made from the highest grade materials, all units are weather-protected for outside use by a purpose-built electrical enclosure, double-insulated for safety. The Clearmaster 4 has ½in hosetail connectors on both inlet and outlet.

Details from: **UV SYSTEMS LTD, Constitution Hill, Sudbury, Suffolk CO10 6QL. Tel: 0787 76259; Fax: 0787 881452.**

## Aquatechnics

Good quality water is paramount to the success of keeping fishes, no matter what species are kept, nor in what type of fishkeeping systems. It seems, however, that the suitability of the basic raw material is deteriorating, if National Press reports are anything to go by. Products to neutralise undesirable, man-added elements in domestic tapwater have done much to help the fishkeeper, but a new purification system from **AQUATECHNICS** takes things quite a bit further.

Working on the reverse osmosis principle, and under ideal conditions, their AQRO-1 unit will produce around 30 Imperial gallons (approximately 35 US gallons — 136 litres) of pure water per day, removing up to 95% of all contaminants found in tapwater.

The unit consists of 5 stages: a 5-micron Polypropylene Sediment filter, a Carbon Block Pre-filter Cartridge, a TFC Reverse Osmosis Membrane (1/10,000th micron), a 3-gallon (13.6-litre) Storage Tank and a Carbon Block Pot-filter Cartridge. A full system includes a 35-gallon (c 160-litre) per day Module, 2.5-gallon (c 11-litre) tank, chrome tap, all fittings and full instructions.

Thanks to the absorption capacity of the pre-filters, performance will be continuous, 24 hours per day for 6 months, before replacement filters are needed.

Apart from being good news for aquarists (especially those keeping and breeding fishes such as Discus, Dwarf Cichlids, etc which require special water conditions), the extra benefits of having pure water constantly available 'on tap' (without the need for carrying bottles around either) include such diverse uses as steam iron and car battery top-ups, ideal for house plant watering and, less concentrates needed when mixing drinks. Cheers!

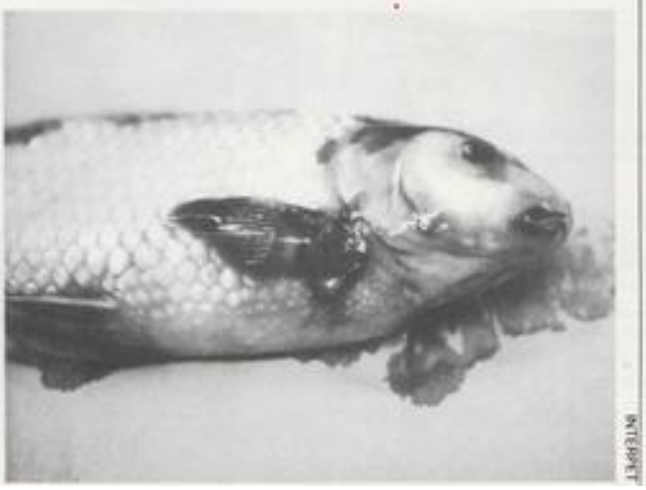
Already, several aquatic centres have provided glowing testimonials as to the performance and price of the units, and you can find out more by writing to **Neil Chapman** at: **AQUATECHNICS (UK), 47 Back Lane, Rochford, Essex SS4 1BE. Tel: 0702 543970; Fax: 0702 530373.**

## Interpet

Faced with dealing with a pond fish with ulcers, most people resort to antibiotics. Although effective, these are: (a) hard to get (a veterinary surgeon has to be consulted), (b) likely to be expensive, and (c) the fish has to be treated out of the pond in a separate tank, or otherwise suitable container, again because the cost of a dose large enough to treat the whole pond would be prohibitive.

Besides that, the physical efforts entailed in netting the fish, not only put it under further stress, but you might even damage other fish in doing so, thus opening up further potential sites for secondary infection — a common cause of ulcers.

**INTERPET** recently introduced ANTI ULCER which has many benefits in addition to curing the problem: it may be used in the pond, is chemico- and bio-degradable (non-harmful to pond filters), is readily available, safe to use with previously 'treatment-intolerant' species such as Orfe and Rudd, and is modestly-priced.



INTERPET

Additionally, Anti Ulcer is also effective against bacterial gill-rot and systemic (internal) bacterial infections (watch out for signs of reddened gills, fin bases and anus; Fin Rot; Mouth Rot and Pop Eye). It can also be used as a preventive measure when introducing new stock to the pond. Available in three sizes — 250ml (treats 500 gallons — c 2,270 litres), 1 litre (2,000 gallons — c 9,000 litres) and 4 litres (36,000 gallons — nearly 164,000 litres) — at RRP £6.90, £16.99 and £39.69 respectively.

Details from: **INTERPET LTD, Interpet House, Vincent Lane, Dorking, Surrey RH4 3YX. Tel: 0306 881033; Fax: 0306 885009.**

## Harper Composites

Books on garden ponds make it look all too easy. How is it they never read like hard work: "Once the hole is dug . . . etc".

It might also be interesting to have a poll as to how many liner ponds leaked through neglecting to protect the underside of the liner sufficiently. We all know about using a thick layer of sand, old newspapers and carpets before fitting the liner, but here again, how do you keep the liner's liner in place while all the struggling goes on? **HARPER COMPOSITES** reckon they have the answer with their LAMINATED POND LINER.

Like in the lager advertisement, don't you really hate it when someone comes up with the obvious? Why hasn't a liner with a protective backing already attached been thought of before? In this case, the backing is 4mm thick polyester felt matting thermally-bonded to a heavy duty, waterproof polythene membrane. This combination liner is made in sheets approximately 5ft wide (1500mm) and has a 2in (50mm) unlaminated edge along one side.

Up to this point, you've got a manageable width of liner all right, but not everybody wants a narrow pond, of course. The next good idea is that extra widths can be stuck together with a high-performance PSA tape (supplied by Harper's) to provide the exact area of liner required. Talking to the company representative, **Lesley Parker**, it seems that the edge-bonding technique is totally reliable so, for the benefit of all those would-be DIY specialists out there, no, old blankets and a roll of Copydex won't do the same thing at all!

OK, you've still got to manhandle the laminated liner into position in the hole but, at least, there won't be any unsightly bumps or ridges from a displaced protective layer to deal with, which you'll only see, of course, once the pond is filled! The new combined Harper Pond Liner will be available direct at approximately £8.90 per metre.

Full details from: **HARPER COMPOSITES LTD, 50 Bradfield Road, Wellingborough, Northants NN8 4HB. Tel: 0933 273866; Fax: 0933 272412.**

## Cyprio

If you went to the International Garden and Leisure Exhibition (GLEE) last month, you may well have seen people hovering around the pond filters, mentally figuring out how they could, in their opinion, do it themselves ("... all I need, is a central heating loft header tank, a few pipes, a pump and a load of old hair curlers. Yes dear, then you *can* have your conservatory ...). However, what they cannot possibly do is what **CYPRIO** can — *guarantee that the system will work!*

It's never too late to plan (even by the time you read this, the coldwater season may be drawing to a close) so, if your pond was beset with green water this summer, do consider the offer being made — *"clear water or your money back"* — on systems fitted with an external filter and ULTRA-VIOLET CLARIFIER (UVC). These unique systems also come with a 12-month product guarantee.

If you were one of the estimated 600,000 new pond installers of 1992, next year might prove to be a disappointment if you didn't consider fitting a Cyprio system right from the start; all sizes of ponds are catered for, and if yours just happens to be one of those odd sizes (right up to 15,000 gallons — 68,000 litres) then a call to Cyprio's planning designers will soon allay your worries and you can relax over Christmas after all.

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


*O-Oooh! Enjoy your holiday, Alf? I didn't expect you back so soon.*