

MARCH 1988 95p

# AQUARIST

AND PONDKEEPER

Peter

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- Oranda Spotlight
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# AQUARIST

AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

MARCH 1988

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Photograph Courtesy of **Macho Ranchus, Singapore**

The Ranchu is sometimes referred to as the Chinese Lionhead. The Lionhead part of the name is derived from the roughened growth on the head and cheeks (hood). In the UK, the name Lionhead has been traditionally reserved for fish, very much like the Ranchu, but with a straighter back. The true Ranchu, on the other hand, has a downturned caudal peduncle which gives the caudal fin an out-of-horizontal alignment.

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"Colossus",  
my record-breaking African  
Bullfrog.

## INTRODUCING BULLFROGS

Large, robust and with huge appetites, Bullfrogs are becoming quite popular in the UK. Steve Crabtree introduces some of the best-known species and offers basic advice on their care.

The word Bullfrog is generally applied by dealers in the pet trade to encompass all large frog species. However, all large frogs are not necessarily Bullfrogs.

Most Bullfrogs are native to the major continents, namely Africa, Asia, Australia and North and South America. Many are true frogs, belonging to the genus *Rana* while others may belong to allied genera.

The most commonly available Bullfrog through the pet trade is the American Bullfrog (*Rana catesbeiana*). This species is sometimes offered for sale in aquarist shops, usually in tadpole form. These tadpoles may be raised in a moderate sized tank (18 x 12 x 12in or 24 x 12 x 12in — 45 x 30 x 30cm or 60 x 30 x 30cm) furnished with a layer of gravel and the water allowed to age for about two days.

Most flaked fish food contains all the tadpoles' dietary requirements without fouling the water, and so is preferable to the meat and vegetable scraps so often used.

### The tadpole/froglet tank

The tadpoles can take either one or two years before completing metamorphosis (turning into a frog) and may reach 15cm (6in) in length. Probably the most crucial time in a tadpole's life is the transition stage to froglet.

The back legs appear first, followed by the front which just appear to 'pop' out from under the skin. At this stage the young appear to be neither frog nor tadpole and are liable to drown if left in deep water.

It is therefore advantageous to transfer any such 'changeling' into a smaller tank set up with an inch of water and gravel banked up to provide a terra firma environment. A pair of knotted tights stretched over the top of the tank makes the 'nursery' escape-proof and provides ventilation. The tank can be furnished with pieces of bark and halved flower pots to provide a retreat while the froglet is absorbing the tail.

### A suitable diet

Once this has taken place the froglet will be ready for its first meal on land. Tubifex

worms, mealworms, crickets and locust hoppers form an easily obtainable basic diet. The live food should be dusted with a mixture of vitamin powder and scraped cuttlefish 'bone'. This assists the formation of sturdy bones as young amphibians are prone to Rickets, or bone softening. Young frogs can grow at an alarming rate and often approach adult size 10-18cm (4-7in) snout-to-vent length in only two or three years. *R. catesbeiana* is an active frog and suitable only for those with the largest of tanks or a pond.

### Some Bullfrog species

A reasonable size pond is preferable for the frogs, this being enclosed in some way so as to make it escape-proof. The American Bullfrog has a range from Nova Scotia to Central Florida, west to Wisconsin and across the Great Plains to the Rockies.

With such an extensive range, specimens imported from the northern extent are well able to weather the British climate. Bearing this in mind, it is important that frogs kept in an outdoor environment do not escape. It is an offence to release, or allow any species not native to this country to escape into the wild. Anyone who cannot guarantee escape-proof conditions should give serious consideration to keeping this species.

Other species may be more suitable for the UK, and the following are sometimes offered through the pet trade: African Bullfrog (*Physicophalus adspersus*), the Indian Bullfrog (*Rana tigrina*) and, from South America, frogs from the *Leptodactylus* genus — such as the "Mountain Chicken". Numbers of the Indian Bullfrog have been sadly reduced. Semi-adult American Bullfrogs are particularly attractive creatures.



STEVE CRABTREE

depleted in the wild as a result of the 'frog leg' trade (which is now banned). Not only is this a hideous and inhumane practice but a false economy as vast sums of money have had to be spent on pesticides in India as a natural means of insect control is being eliminated.

Most of the South American Bullfrogs are seldom imported, and those that do, are beyond the price range of most hobbyists. Before acquiring any exotic pet I would advise prospective owners to make sure they can house, feed and heat their acquisition.

### Captive-bred stocks are best

I would also recommend that, where possible, young captive-bred stock be purchased for all reptiles and amphibians. The reasons for this are as follows:

(i) captive-bred stock should be free of disease and internal parasites, which are often present and undetectable in wild stock.

(ii) the age of young specimens can be ascertained with more certainty than with adult stock.

(iii) purchasing young of any animal gives you the pleasure of watching them grow. A good point to remember is that two or three young animals can often be purchased for the same price of a single adult.

### Colossus

My own preference is for the African Bullfrog (*Physicophalus adspersus*) often called 'Pixie Frog' by the pet trade. In fact, nothing could be further from the truth as this is the daddy of all Bullfrogs. My specimen, called 'Colossus', was bought as part of 'job lot' of amphibians and weighed about a pound and a quarter. Over the next two years Colossus's weight increased to over four pounds and he is now in the 1987 Guinness Book of Records as Britain's heaviest captive frog. While awaiting confirmation of my record I learned from the Guinness Animal Records Department of a specimen that died in 1981 in Capetown S. Africa. At its peak it scaled six pounds ten ounces!

A basic set-up for this species is preferable, with a foam base cut to size and a piece of foam bent over to form a cave. A water bath is provided and is used especially during skin shedding which frogs undertake on a regular basis. The tank is heated by means of two red 60W lamps connected to a thermostat set at about 24-26°C (75-79°F). The basic diet is crickets, locusts, worms and frozen mice and chicks which are bought from pet shops or breeders' surplus. This giant 'Cow Pat' of a frog sits quite inert for most of the time coming to life to feed and bathe.

In the wild, this frog spends much of its time buried during periods of drought, a process called 'aestivation', and is protected by a waxy membrane. At the onset of the rainy season the frogs emerge, eat their water-containing skin and feast on the abundance of food available at this time. Breeding has to be completed before the ponds dry out and the frogs bury to form 'living tombs' again.

# Seaview

by Gordon Kay

## Protection for the North Sea

We all know how important the North Sea is in ecological terms, not just because it is so close to home, but because it provides a significant proportion of the food we eat. Last month, the Marine Conservation Society issued a press release which I found extremely disturbing, highlighting some of the problems in the North Sea and the lack of any concrete action to remedy the situation. Some of the points it raised were:

1. An increase in the occurrence of cancer in fishes.
2. The effects which toxic chemicals have on seabirds and seals, some of which are unable to breed, while others have wounds that will not heal.
3. The disappearance of dolphins from areas in which they were once common.
4. The total lack of oxygen in some parts of the sea.

The Environment Ministers from the countries surrounding the North Sea met in London recently to discuss the problem and plans for the area's protection. This was the second such meeting in three years. The Bremen Declaration was the result of the first conference, held in Bremen, Germany, in 1984. It was signed by all ministers present (including the UK) and covered most of the major problems of the North Sea. Had this declaration been acted upon, it is unlikely that the area would be in the state it is now but, sadly, it wasn't, and things such as I have listed above are the result.

However, environmental groups from various European countries have now joined forces to bring pressure to bear on the ministers and the MCS is leading the way by presenting the case for action. Their recommendations are:

1. That waste producers should apply the most advanced techniques to prevent pollution — even if damage to the environment is not proven. This should be based on environmental requirements and NCT on economical considerations.
2. Governments should work towards an end to industrial

and sewage waste and ocean incineration by 1990.

3. The Wadden Sea is an area of coastal wetland which lies next to Denmark, Germany and the Netherlands. It consists of 10,000 sq.km. of very productive mudflats, sand bars and salt marshes, which makes it the biggest wintering area in Europe for wading birds and wildfowl — with more than 5 million birds each year. It is also a nursery for around half of the fishes in the North Sea. Concern for the Wadden Sea is widespread and it is clear that the health of the area is the responsibility of all North Sea countries. The MCS recommends that:

- a. The North Sea countries should join forces to protect the area.
- b. Measures should be taken by all North Sea countries to reduce the input of pollutants to the Wadden Sea.
- c. Regular status reports should be produced to ensure that the Wadden Sea is protected.

There are many other aspects of conservation in the North Sea that MCS are concerned with and are making recommendations on, such as pollu-

tion from shipping, nutrient enrichment and monitoring the success of the recent conference. It will be a long, hard battle but, judging from past experience, MCS will do their utmost to achieve their aims.

But the protection of the sea (throughout the world) is the responsibility of us all. We bathe in it, we ultimately drink it and most people get an important part of their diet from it (I would rather that we were all vegetarians but that's another soapbox). Just as importantly of course, is the fact that our pets come from it. Anyone interested in joining the Marine Conservation Society should write to 4 Gloucester Road, Ross-on-Wye, Herefordshire HR9 5BU. Apart from anything else, it will provide another dimension to your interest in the marine world.

## Snippets.

1. Octopus are chameleon-like characters who can change their appearance to suit their surroundings and, because of this, are rarely spotted unless disturbed. Their secret lies in the small elastic bags of colour pigment in their skin. By

stretching the bags to cover a large area, they become very dark, and by allowing the bags to shrink to tiny specks they become almost white.

As different bags can be stretching or contracting simultaneously in different parts of the body, an octopus can blend in well, even against coral rubble.

2. The octopus's cousin, the squid, rivals fishes as a superb swimming carnivore. Many species swim in large schools and feed on crustaceans and fishes, catching them with two very long tentacles which are usually retracted into pockets near the mouth, but which can be shot out with great speed and accuracy when prey is sighted.

3. Going back to octopus; did you know that they had *three* hearts?

4. One of the many different types of alcyonarians — soft corals — is the gorgonian, a typical member of which is the sea-fan. It orients itself so that its flexible lattice structure faces into the prevailing current to trap food. The interesting thing is that this lattice is very much influenced by the strength of the current. In an area with very little water flow, the lattice is very loosely formed, with large spaces between, but in strong currents, the structure is really tight, with hardly any gaps at all, thereby maximising the food available.

5. Although many people confuse blennies with gobies, they belong, in fact to two different families. Sure ways to tell one from the other are that in the goby, the ventral (pelvic) fins are fused together to form a suction cup; blennies lack this. Also, blennies have "antennae" above the eyes which are missing on the goby. A further point; the fish that everyone calls the Mandarin Goby is not a goby at all, but a dragonet.

6. Some scallops have a series of black eyes around the edge of their mantle which are used to sense shadows and changes in light intensity. These "eyes" can therefore put the scallop on its guard against predators and, at the merest hint of danger, allow it to "clam" up!

Until the next time . . .

Some soft corals will align themselves in accordance with the prevailing currents.



CORAL WORLD — ELIAT

## PRODUCT ROUND-UP

By Dick Mills

# GOLDFISH BOWLS AND OTHER ACCESSORIES

As we have concentrated a little more on the Goldfish in this issue, it might be well worthwhile to see what kind of deal — carewise — they are getting at the hands of the beginning hobbyist. Unfortunately, not all novices start off with the highly-recommended tank, sentencing their charges to a life in circular quarters.

However, there are bowls and bowls. **Amphill Aquatics**



There are bowls and bowls — and this is a really good one from Amphill.

retail a 17-litre, 14in diameter "bowl" giving quite a reasonable water surface area (these were featured in *Coldwater Jottings*, A & P, July '87). Also new for 1988 are two, twin-cistern type pond filters especially-developed for Koi, these are the 25D KOI and 50D KOI models. Details from **AMPHILL AQUATICS**, Abridge Road, Theydon Bois, Essex CM16 7NR. (Tel: 037 8814545).

**Interpet** also have as stock items ten-sided, large surface area containers that might just come into the bowl category. These are available in 2.3, 3.2 and 4.2-litre sizes. For smaller fishes (such as Japanese Ricefish or White Cloud Mountain Minnows) their French Glass Bowls come in six sizes with a choice of plain, fluted top or fluted neck designs. Please note that these are not designated as suitable for use with Goldfishes; their range of **Neptunus Tanks** and **Panorama Aquariums** are much more suitable.

Failing all exhortations to the contrary, if you are deter-

mined to use a 'Goldfish Bowl' then the very least you can do is to fit an almost mandatory extra, such as the Ecology Fish-bowl Filter. This subgravel biological filter has a circular plate which can be fitted to any bowl having a 4in or larger top opening. A **Whisper 100 Air-pump**, together with a plastic plant, completes the kit, which will alleviate many of the problems of 'bowl existence.' Details from **INTERPET LTD**, Interpet House, Vincent Lane, Dorking, Surrey RH4 3YX. (Tel: 0306 881033).

**Rolf C. Hagen** have also given some thought to bringing some relief to 'bowl inhabitants', by marketing a **Goldfish Bowl Filtration Accessory Kit**. Complete with an **A800** air-pump and airline tubing, this biological filter system is available in two sizes, small and medium. Goldfish bowls in sizes of 6in high by 4in diameter, 9in x 7in, 12in x 10in and 17in x 14in, together with a Junior sized **Aquarium Starter Kit**, get young fish-keepers off to a good start. The **Aquarium Kit** comprises a 16in x 8in x 10in tank with fluorescent canopy and lamp, biological filter and **A800** airpump, airstone, aquarium water conditioner, ceramic ornament and some fish food — all for around £43. As a follow-up, there is always **Nutrafin's Goldfish Food**.

Details from **ROLF C. HAGEN (UK) LTD.**, 275 Kirkstall Road, Leeds LS4 2BZ. (Tel: 0532 796566).

### Recent and latest Goldfish varieties

**Gary Lewis**, supplier of quality Goldfish to many outlets, has provided the following details of latest strains to reach England. From Japan, the **Hamanishiki** — it has a pearl-scale body and finnage, but an additional feature is a bubble-eye development over each eye.

This 'bubble' is a stiff membrane and not floppy as in the genuine Bubble-Eye variety. Metallic and nacreous types are available and this variety is now being bred in this country.

Recent varieties from China include the **Butterfly Moor** — similar in body to the standard Moor, this telescopic-eyed variety has a butterfly tail which, when seen from above, is reminiscent of the **Tosakin**. The **Red-Capped Moor** has a red cap to the head on a black body. The **Telescope-Eyed Oranda** has, in addition to the normal Oranda features, telescopic-eyes just protruding through the hood.

The **Black Ranchu**, **Black** and **White Oranda** and **Choco-**

late Oranda (with red hood) are just some examples of the developing varieties in the species which set off fishkeeping the world over. Specimens are available in sizes from small to large, the most popular size range being around the 3in mark. Gary says he is always pleased to see hobbyists, but due to the pressure of work maintaining these prize specimens (especially now he is breeding some of them), he would appreciate an advance telephone call to make an appointment. Information from **G. LEWIS**, Coldwater Fish Specialist, Rancho Lodge, Stone Street, Westenhanger, Kent CT21 4HS (tel: 0303 66741).

## NEW PRODUCTS



The Interpet range of freeze dried foods.

Ask any hobbyist what is the best food for fishes and the answer will always be live foods. Unfortunately, the drawback of such foods (apart from their seasonal availability) is the risk of introducing disease.

Freeze-drying harvested live foods will capture their nutrient value and allow the food to be stored for long periods of time without deterioration of quality. The process does indeed kill most disease-causing organisms, but, to make sure, irradiation is another step used in

the process to make doubly sure. In addition to ensuring that the food storage bag is adequately waterproof, the **Interpet** range of ten freeze-dried foods (**Tubifex Worms**, **Brine Shrimp**, **Mini Shrimp**, **Mosquito Larvae**, **White Shrimp**, **Blood Worm**, **Fish Eggs**, **River Worm**, **Daphnia** and **Krill Shrimp**) have all been irradiated so that you can be sure of feeding not only nutritious, but now totally safe, foods. Don't forget too, that freeze-dried foods are suitable

not only for all aquarium fishes, but for terrapins too!

Details from INTERPET LTD, Interpet House, Vincent Lane, Dorking, Surrey RH4 3YX. (Tel: 0306 881033).

## ALGARID

Dangling a magnet in your pond doesn't sound like a good way to combat algae or slime, but an application of this theory on more scientific lines is said to do just that. ALGARID is a series of powerful ceramic magnets which can be installed in both the water supply system and filtration system to your pond and reduces the growth of algae by starving them of their necessary nutrient supply. By reducing slime growths, clogging up of filters, fountain-heads etc can also be minimised.

ALGARID used no power nor chemical additives, there are no moving parts and nothing to go wrong in its indefinite lifespan. Anything from 1.5in to 8in diameter pipes can be accommodated! You can obtain further details from MMR LTD, Unit C7, 426 Long Drive, Greenford, Middlesex UB6 8UH (Tel: 01-575 6713).

# PUBLISHING NEWS

## Salamander authors gather to launch the next million

At the official launch of Salamander Books latest publication, *The Marine Aquarium* held on 21 January, were many of the authors responsible for the output over the past six years of the highly-successful range of Encyclopedias and Fishkeeper's Guides. Joining Dr Gwynne Vevers and Dick Mills (authors of the original *Practical Encyclopedia of Tropical Aquarium Fishes*) were David Alderton (Reptiles and Amphibians), Dr Chris Andrews (Fish Breeding, Fancy Goldfish), Dr Neville Carrington (Maintaining a Healthy Aquarium), Barry James (Koi, Aquarium Plants), David Papworth (Garden Ponds) and Peter Scott (Live-bearing Fishes).

The constant editing factor of Geoff Rogers and senior designer Roger Hyde, Paul Turner and Sue Presley from Stonecastle Graphics (designers of *The Marine Aquarium*), together with David Allison, Eric Crichton, Andy Horton and Gina Sandford (representing the photographers)



Dick Mills surprises editor Geoff Rogers with an unexpected present for all his work on Salamander Books at the launch of *Dick's Encyclopedia of the Marine Aquarium*.

sent to the assembled 'media persons' (including *A & P* Editor John Dawes) the strength of original talent and professional back-up teams that make up the Salamander driving force.

Managing Director Malcolm Little paid tribute to the hard work put in not only during the production runs (Geoff Rogers likened publishing to an atomic power

station) but also by the post-production team of marketing, notably the distributing force provided by Interpet. When he also divulged that international sales had passed the one million mark in only six years, that was the final icing on the cake.

Details of all aquatic publications from Lorraine Shearing, Salamander Books Ltd, 52 Bedford Row, London WC1 (Tel: 01-242 6693).

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# News

## Major show for Alexandra Palace

Fishworld 88, scheduled for 21-22 May 1988, is the first-ever combined exhibition and trade show where both aquarium and pond fish will be on display, together with all the equipment required for successful fishkeeping. The Exhibition aims to promote the hobby, both to aquarists and the general public.

Organised by the Federation of British Aquatic Societies to celebrate their 50th Anniversary in style and sponsored by TFH Publications, well-known for their extensive range of aquatic books, Fishworld 88 already looks set to be a winner.

Fishworld 88 will combine

### Pet Show moves to NEC

Britain's longest-established exhibition of pet and aquatic goods moves this year to the National Exhibition Centre in Birmingham, where it takes place over 1-2 May.

Restricted to trade buyers, the British Pet Industry Exhibition was an annual event in Harrogate for 25 years, but the continuing growth of the show, which now has nearly 200 exhibitors, has necessitated the move.

It also has a shorter name — Pet 88.

The exhibition is organised by Pet Business World magazine from its offices at 9 Tufton Street, Ashford, Kent TN21 1QN. Tel: (0233) 43639.

the best of all worlds, with displays of a wide variety of aquatic equipment and accessories for tropical, marine and coldwater fish, plus the fish themselves, including superb

displays of exotic and specialist society fish — even fish specially imported for the occasion. Every aspect of fishkeeping will be on show here.

The exhibition is also the

### Chance to meet Tetra expert

One very important aspect of Dr David Pool's work at the Tetra Information Centre is visiting aquatic clubs and societies to give presentations about various aspects of fishkeeping and to discuss any fishkeeping problems that club members may have. Dr Pool's talks are

proving very successful, and all the clubs and societies have agreed that they are happy to welcome guests to the talks. If you'd like the chance to meet Dr Pool during the next few months, he will be attending the following shows and meetings.

- 3.3.88 *British Koi Keeper's Society, Middlesex and Surrey Border Section. Venue: The Crown, Russel Road, Shepperton, Middlesex. Talk on 'Diagnosis and Control of the Diseases of Koi'. Start at 8.00 pm.*
- 23.3.88 *Merthyr Aquarist Society. Venue: The Holybush Hotel, Merthyr Tydfil, Mid Glamorgan. Talk on 'Diagnosis and Control of Fish Diseases'. Start at 7.30 pm.*
- 31.3.88 *British Koi Keeper's Society, Mid-Lincs Section. Venue: The Lea Gate Inn, Coalingby, Near Boston, Lincs. Talk on 'Water Quality and Koi'. Start at 8.00 pm.*
- 17.4.88 *British Koi Keeper's Society, Essex Section/Langley Aquatics Koi Seminar. Venue: Dolphin Leisure Centre, Romford, Essex. Talk on 'Fish Diseases'. Start at 9.30 am. End at 6.00 pm. Tickets (£12) from Mr Bobbie Barton (0702) 611750.*
- 16.5.88 *West Midlands Marine Aquarist Group. Venue: 'The Globe', Reform Street, West Bromwich. Talk on 'Diagnosis and Control of Marine Fish Diseases'. Start at 7.30 pm.*
- 20.5.88 *Northern Area Group of the Catfish Association of Great Britain. Venue: The Odd Fellows, Bryn, Nr Wigan, Lancashire. Talk on 'Fish Anatomy and the Diagnosis of Fish Diseases'. Start at 8.00 pm.*
- 6.6.88 *Portsmouth Co-operative Aquatic Study Society. Venue: Co-operative Victory Rooms, 72 Framon Road, Portsmouth. Talk on 'Diagnosis and Control of Fish Diseases'. Start at 8.00 pm.*
- 15.6.88 *British Koi Keeper's Society — Peterborough Section. Venue: The Crown, Lincoln Road, New England, Peterborough. Talk on 'Diagnosis and Control of Fish Diseases'. Start at 7.30 pm.*
- 28.9.88 *Isle of Wight Aquarist's Society. Talk on 'Diagnosis and Control of Fish Diseases'.*

For further information contact Tetra Information Centre, Mitchell House, Southampton Road, Eastleigh, Hants SO5 5RY.

occasion for an International Open Show which will be judged to FBAS Standards. For further details contact: Fishworld 88, Cliveden House, Priors Way, Bray, Maidenhead, Berks SL6 2HP. Tel: (0628) 38912.

### Free check for powerhead 200 model

Although the Hagen Aqua Clear Powerhead 200 is entirely safe in normal use, incorrect reassembly of the impeller after purchase by the customer may occasionally lead to the impeller jamming and the motor becoming overloaded as a result, says Rolf C Hagen (UK) Ltd.

As this might, in some circumstances, bring about a breakdown of the insulation and the attendant risk of electric shock, Hagen are offering to re-test, without charge, the insulation of all Aqua Clear 200 Powerheads purchased during 1986 and 1987.

A company spokesman says: "Out of the tens of thousands sold, the problem has been identified in only a handful of instances. Nevertheless, the free check will help to assure all users that their equipment is completely reliable."

Powerheads should be returned direct to Rolf C Hagen (UK) Ltd, 275 Kirkstall Road, Leeds LS4 2BZ, who will refund postage up to 75p. Normal turnaround time is three days.

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# Letters

## Plant lovers unite

It would seem, searching through aquatic magazines from all over the world, that there are societies devoted to the culture of virtually every aspect of the hobby, bar one, namely 'Aquatic Plants'.

While nearly every freshwater aquarium has its complement of plants, a survey of aquarists would almost certainly show that growing aquarium plants successfully is the biggest problem most people face.

In America they seem to give up in disgust and buy plastic imitations, but strangely enough, 'plastic fish' do not seem to have caught on in the same way! Magazine editors devote nearly all their 'colour quota' to fish, while plants are invariably in good old 'black and white'. Seldom does the front cover depict anything other than a shot of a fish's head.

The range of plants available

to the public consists of good old reliable types, plus an assortment of bog plants and house plants. While the world's collectors scour the world's waterways for new fish, they ignore the new unusual plants, probably trampling on them in their eagerness to get at the fish.

However, there is a growing body of people in the hobby who take plants very seriously indeed and are keen to experiment with new species, as and when they become available. I know a man in Brazil who lists over 300 species of aquatic plants, including some 30 of the 50 known species of *Echinodorus*. Many of these species are not listed in any popular work on the subject, but are no doubt tucked away as pressed specimens in the British Museum. The problem is, that for any importer to bring in these rare plants, there must be sufficient numbers of people who are keen to try them, as all these species must be ordered



You, too, could grow plants like these if you join the International Society for the Study of Aquatic Plants.

in large numbers to make it economical for the collector to go and collect them.

With a large body of hobbyists trying new plants and ready to pool their information on their experiences, a great deal more knowledge could be gained. To this end, I have taken it upon myself to form a society entirely devoted to aquatic plants. It will be called: **The International Society for the Study of Aquatic Plants.**

The first meeting will be held at **The Cotswold Wild Life Park Lecture Rooms,**

Burford, Oxon. This will take place on **Saturday, 26 March, 1988, starting at 2.30pm.**

Will all those people interested in joining the society and/or attending this meeting please telephone me in advance on (0285) 4656? I will then be able to give you further details.

One final point: I envisage the society being interested in catering for all types of aquatic plants, whether they be tropical, coldwater, marine or garden pool plants.

**Barry James**  
Baunton, Gloucestershire.



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# News from the societies

## Union of Scottish Aquarists

We have received the following details from the newly-formed U.S.A.:

"A new Union has been formed by fellow Aquarist Societies. THE UNION OF SCOTTISH AQUARISTS has the potential to:

1. Organise speakers to attend member club meetings.
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7. Organise inter-club fish shows.
8. Organise fish auctions at Open Shows.
9. Organise regular fish auctions.

Every member club will have one representative serving on the Organising Committee and foster close contact with the individual aquarist (including all fellow societies and individual aquarists in the U.K.)."

For further information contact: Mrs J. Ross, Secretary of Union of Scottish Aquarists, 22 Gartmorn Road, Sauchie, by Alloa, Clackmannanshire, FK10 3NX, Tel: (0259) 213893.

## Hull's 25 Years Of Fishkeeping (1962-1987)

Last year the Hull Aquarist Society celebrated its Silver Jubilee. Formed in 1962 by four friends, the basic rules and aims of these avid aquarists remain today: "To promote the keeping, breeding and showing of tropical, coldwater and marine fish. Rules to be kept to the strictest minimum."

The society meets twice per month (on the second and fourth Mondays) with the exception of May, when there

are no meetings, and December, when the only meeting is on the second Monday. Meetings take place at the Windmill Public House, Witham, Hull, starting at 8pm. The wide and varied interests and knowledge of members are reflected by the fact that Trevor Douglas the Chairman, is a Yorkshire 'A' Class Judge, Chairman of Judges and Standards, Chairman of Yorkshire Delegates Committee and Chairman of the Statements League Delegates Committee. The society Treasurer, Colin Taylor, is also past Treasurer of SLAG (Yorkshire) and SLAG (National Association). The President, Roy Willerton, is a past Vice-Chairman of the Killifish North East Group. Other members of the society express their diverse

interest with membership of most of the specialist groups.

For further information contact E. D. Tyler, Vice Chairman and P.R.O., 7 Unity Avenue, Hull Road, Hessle, HU13 9NF. Tel: (0482) 643235.

## North East Federation of Aquarists Society

The N.E.F.A.S. Open Show held last September attracted a large number of entries for the second year running. The **Best Fish in Show** award went to Mr D. Stott of D.H.S.S. for his American Flagfish, *Jordanella floridae*. The **Best Exhibitor** was Mr S. King, also of D.H.S.S., and the **Best Society** was yet again, D.H.S.S.

N.E.F.A.S. would like to extend sincere thanks to all sponsors and exhibitors for making the Show such a great success.

For further information, contact S. King (P.R.O. — N.E.F.A.S.), 59 Tollesby Bridge, Coulby, Newham, Middlesbrough, Cleveland TS8 0SE.

## Ellesmere Port Aquarium Keepers Society

E.P.A.K.S. meetings take place every other Tuesday evening, starting at 8.00 p.m. at the R.A.O.B. Club, Station Road, Ellesmere Port. All aspects of the hobby are catered for. Everyone welcome. For more information, contact Phil Edwards on (051 678) 0930.

## Diary dates

### Willenhall Aquarist Group

Meetings of the above society are held on the last Saturday of the month. Old and new members welcome. Ring B. Pheazy on Wolverhampton 723418 for further details.

### Rugeley and District Aquarist Society

This new society meets on the first Wednesday of the month at Mossley Public House, Armitage Road, Rugeley, starting at 8.00 p.m.

### Skegness & District Aquarist Society

The 1988 S.D.A.S. annual Open Show will be held at a new venue, the Richmond Hotel, Richmond Drive, Skegness, on **Sunday 20 March**. For further details, contact the Show Secretary, Mr A. Patterson, 1 Brunswick Drive, Skegness, Lincs., PE25 2QT.

### Central Midlands Cichlid Group

A Cichlid- and Catfish-only Show, plus annual auction, will be staged by the C.M.C.G. starting at 10.00 a.m. on **27 March** at Penkridge Memorial Hall, Penkridge, Staffs. Meetings of the C.M.C.G. are held on the third Wednesday of each month at The Cedar Tree Hotel, Breton, Rugeley. For

further details, ring Rugeley 77958 or Burntwood 76004.

### Bishop Auckland Aquarist Society

The 20th Open Show of the B.A.A.S. will take place on **Sunday 27 March**. Full details from the Secretary at 44 Ridge-side, North Close, Spenny-moor, Co. Durham, DL16 7HG.

### Association for the Study of Reptiles and Amphibia

Conserving and caring for the fascinating animals they love is the aim of the Association for the Study of Reptiles and Amphibia (ASRA). Snakes, lizards, newts and frogs will be among the stars at the ASRA Show to be held at St. Aldhelm's Church Hall, Edgeware Road, Swindon, Wilts., between 10 am and 5 pm on **Saturday, 26 March**. Through demonstrations, exhibits and talks, ASRA's experts will be hoping to increase public appreciation of these creatures and to teach good practices in handling, keeping and breeding them. For further information, contact Richard Allen, 8 The Broadway, Lambourn, Berks. Tel: Lambourn 71439.

### Runcorn Aquarist Society

The 17th annual Open Fish Show and Grand Auction of R.A.S. is to be held on **Sunday,**

**27 March** at the Royal Naval Association, Halton Road, Runcorn. Benching: 11.30 am - 1.30 pm. Details from Gary Janion (Hon. Sec.), 18 Dalton Street, Runcorn, Cheshire WA7 5NW. Tel: (09285) 61521.

### Anabantoid Association of Great Britain

The A.A.G.B.'s Members' Weekend and 1st Open Show will take place during the weekend **9-10 April** at Ranmoor House, Sheffield University. On the Saturday, there will be a programme of lectures, a Closed Anabantoid Show and an auction. On Sunday, after the A.G.M., there will be (for the first time), an Open Show staged by the A.A.G.B. Yorkshire Group. There will be 42 classes, including 11 of Labyrinthfishes. The day ends with an open auction. More details from Stephen Clark, 10 Ashfield Road, Balby, Doncaster. Tel: Doncaster 859278.

### King's Lynn Aquarist Society

This year's Open Show is scheduled to take place on **10 April** at King's Lynn Corn Exchange. Details from Mr T. Scheldrick (Show Secretary), 22 Halifax Crescent, Blenheim Park, Sculthorpe, Fakenham, Norfolk NR21 7PS. Tel: East Rudham 8868.

# Your questions answered

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Every 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 expert to whom your query should be directed. All letters must be accompanied by a S.A.E. and addressed to:

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## Koi Pox problem

Several of my Koi have what appears to be grey growths on their sides and fins. They vary in size and stand proud of the body. Only some are infected at present. Can you tell me what the disease is, if it will spread, and how to cure it?

From the description, I would suspect that your Koi have Carp Pox. This is a virus infection which attacks certain species of fish, particularly all members of the carp family. Fortunately, Carp Pox, although transmittable by contact, is not dangerous or detrimental to our fish, except in very rare occasions with old fish.

It is an infection that attacks fish when their own natural defence systems are not fully functioning, such as during the winter months when the fish are dormant. First signs of the disease are the appearance of small reddish or milky grey growths. These usually begin on, or at the base of, fins. The problem is sometimes called "Jelly Blobs" and that is what the infection looks like. As the condition progresses, these blobs can grow and spread, and will eventually form into a hard scale-like growth on the surface of the fish.

The cure for this infection is to get the fishes' own immune system working again. This happens naturally when the

weather warms in the spring, and most people usually leave well alone until this takes place and the fish "heals" itself. Obviously, the application of artificial heat to the water will also help cure this complaint, but this must be maintained until the natural water temperature matches that of the artificially heated water, or the problem will recur.

## Tropical Hungry dollars

I have a pair of Silver Dollars but all I know about them is that they are plant eaters. Mine have reduced six Vallisneria gigantea to stubs in one week. Could you tell me more about this attractive, but hungry, species?

Your Silver Dollars are probably *Mylossoma argenteum* (although several other species are also known by this common name). *Mylossoma* originates from central South America. It is a peaceful species but may grow quite large — it reaches 9 inches in the wild. It has a healthy appetite and, although not strictly vegetarian, it will eat any plants that are not plastic! Flake food is readily taken, but an occasional lettuce leaf is useful to keep the fish in good condition.

This species is not fussy about water chemistry but the ideal is neutral, even slightly



This is *Metynnis hypsauchen* (*schreitmulleri*) one of several similarly-looking fish commonly referred to as Silver Dollars.

alkaline water at 78°F (25°C). It is a schooling fish, so the aquarium should house 3 or more. With their size this presents a problem, and that is why:

(i) most specimens are seen in the large public aquaria, and  
(ii) the usual hobby literature does not usually list them.

There are no obvious sex differences and no reports of aquarium breeding.

## Horsefaced Cat . . . or is it Loach?

The other day I saw a Horsefaced Catfish in my local shop. Can you supply any details regarding this fish? I would like to get one for my community tank.

As far as I know, there is no Horsefaced Catfish. What you probably saw was the Horsefaced Loach, *Acanthopis chlor-*

*hynchus*, also called the Long-nosed Loach.

It is not a good community fish, being nocturnal and preferring to bury itself during daylight. Fine gravel, or preferably, sand is needed for the fish to hide in. It eats live food at night, so a nocturnal diet of *Tubifex*, white worms, earthworms, etc. is required. With this night feeding, the fish will grow to 6 inches, whatever sized tank you have.

Still want one?

## Fishy nite-lite

I have a four-inch Electric Catfish in a three-foot tank. The problem is that, since it is nocturnal, I hardly ever see it! Any ideas?

I suggest that you use a "night light". A 15-watt red lamp (of the type used in artificial fireplaces) will allow you to see your fish at night. Red light is poorly seen by fish.

## Amazonian "leaves"

I am very interested in the Leaf Fish but can't find any information on this species. Can you help me out?

The Leaf Fish, *Monocirrhus polyacanthus*, originates from South America, especially the Amazon Basin, in slow-moving streams. In the wild it feeds on other fish and insects and will require a similar diet in the aquarium. Use chunky fish and meat and clean *Daphnia* or Bloodworms etc.

It will need patience to feed this fish because it will not chase food but waits for a mouthful to pass by its large mouth, which it uses to suck in the prey. It will live with other species that are too large for it to swallow. Water should be Amazonian, ie soft and slightly acid, at about 77°F (25°C). Maximum size is about 4in (10cm).

There are no obvious sex differences — in fact, as its name suggests, this fish looks more like a leaf than a fish — but if a pair is found from a shoal, they breed readily, laying sticky eggs on plants. Remove the parents and raise the young on a carnivorous diet.

## Coldwater Coldwater/ tropical mix

*I am thinking of keeping my goldfish in the same tank as some tropical community species. Is this OK?*

I know of some fishkeepers who successfully mix goldfish varieties with tropical fish and so, one might say,

have the best of both worlds, though it is a thing which I personally, am not in favour of.

Goldfish are able to tolerate a wide range of temperatures, but appear to be happiest in the range of mid 60's F (c 18.5°C). Continuous high temperatures speed everything up: growth rate, appetite, and life cycle. Therefore the life expectancy of fish kept under such conditions is shorter.

## Plants Green pond water

*I have a pond that is 3 feet deep and is always green. I have a little filter running day and night but it doesn't help at all. How can I eliminate the problem? I've already lost two fish.*

First of all I should like to assure you that on its own "Green Water" does not kill fish. In fact, fish thrive in it. Therefore, you must look at other causes for the loss of your fish. I would suspect a disease, rather than water quality.

The thing to remember with filters is that they must be adequate for the size of the

pool. Remember that the size of the filter must not be less than 10% of the volume of the pool if it is to work efficiently. You do not have to drill holes in your liner if you do not wish to, but you cannot then have the advantage of a bottom drain to remove heavy detritus, and you will have to use another method to remove this. In conclusion I think that you will have to upgrade your filter system to win your battle against green water (although other factors, such as shade, and adequate stocks of submerged, oxygenating plants will also help).

## Marine Beginner's stock

*Would you please give me some advice on which fish I should be thinking of getting for a 48in tank? Which are the easiest to feed and keep? I already have four Damselfish which I am thinking of changing for showfishes.*

I'm afraid that the enormous variety of corals and invertebrates now available to the marine aquarist means that I

can't answer you in detail.

Your best plan is to proceed by the following stages:

- (i) Work out the gallonage of seawater in your aquarium.
- (ii) Work out your stocking level on the basis of 1 inch of fish maximum to each 4 gallons of seawater if you have an under-gravel filter only, or 1in of fish to each 2 gallons of seawater if you have a power-filter operating an undergravel filter in reverse-flow mode. In either case, supplementary aeration should be provided by a powerful airpump operating through a wooden micro-diffuser.
- (iii) After reading a good book on marine life choose the minimum number of showfishes which you fancy from the book's description and:
- (iv) Take this list to your local marine life retailer, and, relying on his/her years of experience to delete any creatures which are unsuitable for your system, ask for your purchase list to be arranged in a sequence of purchase, ie. in such an order that you are purchasing the more shy, delicate creatures first and giving them time to establish their territory before adding the hardier, more boisterous, specimens.

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## FOCUS ON GOLDFISH

# WHAT IS A GOLDFISH?

The Goldfish is, without doubt, the best-known fish in the whole world. It seems that everyone who has ever lived (well, almost everyone!), including John Dawes, has kept at least one of these delightful fish at one time or other.

Countless thousands of children and adults have been introduced to the world of fishkeeping via the ubiquitous "Fairground Goldfish" which is still given away as prizes for anything from a tombola to a coconut shy. (This practice has, happily, now been banned in certain areas.) Faced with the unexpected responsibility of having to care for a living organism, many new owners go the whole way and buy all the necessary accessories to keep their new acquisitions in the carefully controlled, safe environment they deserve. One thing leads to another and, before they know where they are, they have (forgive the pun) been inextricably hooked! A lifetime of dedication, unending interest and fascination then follows.

Sadly, there are always two sides to every story, and a disturbingly high proportion of Fairground Goldfish meet their death every year in a myriad of small, putrid, watery graves. In the majority of cases, though, death is caused quite unintentionally — it is not neglect, lack of interest, or the existence of a murderous streak on the part of the owner that causes it. More often than not, it is the owner's efforts at ensuring that the fish are well-fed which leads to their death as the surplus, uneaten food quickly rots, releasing toxic substances and, at the same time, consuming large quantities of life-giving oxygen.

Despite the considerable distress that this has generated over the years in young and old alike, the Goldfish still remains a firm favourite throughout the world. What is it, then, that makes this fish so popular that it holds the unique distinction of having a special aquarium, the Goldfish Bowl, named after it?

To many, a Goldfish is, as the name suggests, a brightly coloured fish which is active, but peaceful, is about five centimetres long (approximately two inches), and has a simple, streamlined body shape with large friendly-looking eyes, an attractively formed mouth with which it incessantly seems to be drinking in water, and an endearing and immediate response to the owner every time s/he approaches the bowl.

All this is, of course, true. However, it only represents a minute aspect of what a Goldfish is, or has been made to be.

In fact, the Common Goldfish that everyone knows, despite its very basic finnage

and body shape, is already at least one step removed from the real Goldfish. I say, "at least one step" because any development or amplification of finnage, body colour or pattern, signifies a step away from the wild form. I will return to this at a later stage. First, though, it seems appropriate to start at the beginning and trace the story of the Goldfish, highlighting some of its most significant aspects.

### The Goldfish and its relatives

The Common Goldfish (my own personal favourite) is scientifically known as *Carassius auratus auratus* (Linnaeus). The "auratus" tag refers to its golden qualities, while the name in brackets is that of the person responsible for giving the fish its scientific label.

In most books, the Goldfish is referred to simply as *Carassius auratus*, i.e. the second "auratus" is omitted. However, the full designation is given here in recognition of the existence of another, very closely related, fish known as the Gibel or Prussian Carp, *Carassius auratus gibelio* (Bloch).

The Goldfish is native to China and certain parts of Siberia, while the Gibel Carp, although also found in the wild in parts of Siberia (the west), is predominantly an Eastern European fish. In the "pure" state, the two subspecies may be distinguished from each other by slight anatomical differences such as the size of the head relative to the body, numbers of gill rakers (these are spine-like structures found on the gill arches), fin rays, and scale counts.

However, the virtually world-wide introduction of the Goldfish into numerous natural bodies of water often clouds any traces of the true distribution and nature of many of the populations found in the wild.

The natural coloration of both subspecies is commonly referred to as olive-brown. The crucial thing is that the colour is not gold or orange/red. This is what I meant when I referred earlier to most people's picture of the Common Goldfish being, "at least one step removed from the real Goldfish."

Gold, red, orange and other colours may, nevertheless, be found in lowland rivers, small lakes and backwaters in nature, but these appear to be the result of introductions of domesticated varieties rather than true, wild populations.

There is a third widely distributed European Carp which has certain similarities with the above. It is the Bronze or Crucian Carp (not to be confused with the Prussian Carp already mentioned), known scientifically as *Carassius carassius* (Linnaeus). This fish has the same olive-brown coloration as the others but has a considerably deeper body, a convex outline to its dorsal fin, grows to a larger size and has different fin ray and gill raker counts. These features are all depicted in the accompanying table.

The only other species that could conceivably be confused with the Goldfish, Gibel and Crucian Carps, is the Common Carp, *Cyprinus carpio* (Linnaeus). However, this fish can be easily picked out even when small by the possession of two pairs of barbels around the mouth. Since the Com-

### DISTINGUISHING FEATURES IN GOLDFISH

SCIENTIFIC NAME	COMMON NAME	SIZE	DORSAL FIN OUTLINE	DORSAL FIN BRANCHED RAY COUNT	LATERAL LINE SCALE COUNT	NO. OF GILL RAKERS
<i>Carassius auratus auratus</i>	Common Goldfish	30 cm (12 in)	Straight to concave	15-19	27-31	35-48
<i>Carassius auratus gibelio</i>	Gibel Carp Prussian Carp	28 cm (c. 14 in)	Straight	15-18	28-32	39-50
<i>Carassius carassius</i>	Crucian Carp Bronze Carp	50 cm (c. 20 in)	Convex	14-21	31-36	26-31

Data largely extracted from A. Wheeler "Freshwater Fishes of Britain and Europe", 1983.



STEPHEN SMITH

Above, Orandas have been popular for many years. One of the more recent innovations is the Chocolate Oranda which, as can be seen in the photograph, has a relatively short "fantail-type" caudal fin. This specimen is quite young and will develop the characteristic "hood" as it grows older.

Right, finnage configuration and colour patterns can occur in any combination and produce very attractive overall effects, as this excellent Calico Fantail demonstrates.



STEPHEN SMITH

mon Carp can grow to one metre in length, large specimens can never be confused with the other, smaller, species.

*Cyprinus carpio* has been intensively bred in captivity, giving rise to a number of forms such as the Mirror and Leather Carps and, of course, the strikingly beautiful Koi.

All these fish belong to the family Cyprinidae which contains about 275 genera, e.g. *Carassius* and *Cyprinus*, with a total of approximately 1600 species, e.g. *Carassius auratus* and *Cyprinus carpio*. Other well known fish belonging to this, the largest of all the families of fish, are the Minnows (*Phoxinus*), Roaches (*Rutilus*), Gudgeons (*Gobio*), Bitterlings (*Rhodeus*), Tench (*Tinca*), Chub and Orfes (*Leuciscus*), Rasbores (*Rasbora*), Barbs (*Barbus*) and "Sharks" (*Labeo* and *Balantiocheilus*).

### Evolutionary potential

Tracing the history of any fish, even "modern" varieties of exotic fish, such as Guppies (*Poecilia reticulata*), is fraught with difficulties. Details of experiments, chance observations and other forms of documentation often prove impossible to find. It will, therefore, come as no surprise to learn that the history of the Goldfish, which spans more than 1000 years, is strewn with complications, speculations and other distracting elements.

At times, it is even difficult to tell fact from fiction. However, the story is all the more interesting precisely because of these

uncertainties and the mystery that surround it.

In evolutionary terms, small, isolated and, therefore, non-interbreeding populations of a species can give rise to a proliferation of variations on a single basic "theme". When the widespread distribution of the various early varieties of Goldfish (in China, Japan and, later, other parts of the Far East, Europe, Russia and, finally, U.S.A.) are viewed in this light, their evolutionary potential becomes quite obvious. Add to this the extreme, severe standards exerted by intense selective breeding programmes over something above 1000 years and we have an outstanding opportunity for accelerating the rate of evolution of this species to an extent that is quite impossible in nature. This is, in fact, what has happened so that, today, some estimates put the number of existing Goldfish varieties at more than one hundred.

### Variations on a theme

Despite differences in Standards between Societies, there is general agreement concerning the overall identification of the main varieties. Therefore, for example, there is universal agreement that a London Shubunkin is a single-tailed, short-finned, Goldfish with mottled coloration which should include a degree of blue. A Bristol

Shubunkin is similar but has longer fins, particularly the caudal (tail). A Comet has an even longer caudal fin than the Shubunkin. It should be pointed and be roughly as long as the body itself.

A Fantail is a relatively short-finned, double-tailed variety with an oval body. A Veiltail is similar to the Fantail but has long, flowing fins. An Oranda has long, flowing fins as well but, in addition, carries a raspberry-like growth on the head called a hood. A Moor is yet another long-finned, double-tailed fish but this time, there is no hood. Instead, the eyes protrude from the head and the overall colour is black.

Pearlscales are oval-bodied, short-finned, double-tailed and possess domed or convex scales which give the impression that the body is covered in pearls. Lionheads have a similarly shaped body, but no pearls or dorsal fin. In addition, the head has a hood similar to that found in Orandas. A Ranchu is similar to a Lionhead but has a highly curved back, particularly around the peduncle (the posterior end of the body which supports the caudal fin). Celestials have similar body characteristics to Lionheads but have no hood and, as their name suggests, have upward-looking eyes. The Bubble-eye takes this development further and has large, fluid-filled sacs which protrude from the eye socket.

The Pompon is yet another oval, usually dorsal-less, twin-tailed fish. This time, though, the eyes are normal but the nostrils (nasal septa) are highly developed into two characteristics, round pompons.

As I mentioned earlier, body characteristics can occur in combination with a range of colours. These are grouped as follows:

- (a) **Metallic** these fish contain a considerable amount of the pigment Guanine which gives the body reflective (metallic) qualities.
- (b) **Matt** lack of reflective components give such coloured fish a non-shiny appearance.
- (c) **Nacreous** these fish have an overall "mother-of-pearl" shine. In some ways, nacreous fish exhibit a combination of the characteristics of both the earlier types.
- (d) **Calico** these fish carry a blue ground colour splashed with black, violet, red, brown and yellow.

**Note:** Some Societies use the Calico classification to include Nacreous and Matt fish as well, as long as they meet the relevant colour criteria.

We have come a long way since those early olive-coloured Chinese fish of more than 1000 years ago. Happily, the end of the road is nowhere in sight. *Carassius auratus* is a very prolific fish capable of laying many hundreds of eggs at each spawning. Throw in even a small fraction of the variations already described, then add some of the chance genetic changes which invariably occur (mutations) and it is evident that the scope for new developments is virtually endless. We have come a long way, but the road ahead is still wide open and inviting, as the new varieties which have appeared in recent years, prove beyond doubt.

## FOCUS ON GOLDFISH

# SUCCESSFUL GOLDFISH REARING

Follow Pauline Hodgkinson's expert advice and you, too, could enjoy a really successful coldwater season rearing your own goldfish

**T**his season many hobbyists will have their first experience of breeding goldfish and, I am quite sure, quite a few will have problems, particularly when rearing the baby fish. Rearing goldfish fry is, without doubt, a hazardous business for the inexperienced. There are several reasons why things go wrong, resulting in various degrees of success or failure. Perhaps now, more than at any other time, it is appropriate to consider the pitfalls and take note of where the problems (and their causes) occur in order to enhance one's chances of success.

### Four important factors

The four most important factors for successful rearing are: *water quality, space, feeding and warmth*. If any of these are inadequate, then results are bound to suffer. This is particularly so if the water quality is allowed to deteriorate, even to a slight degree; this is the most common cause of fatalities among fry.

The first mistake often occurs when the spawning tank is too small, for once the fry have hatched they will be at a disadvantage from the very outset if their quarters are crowded. Even from a relatively small spawning there could be several hundred fry, and once hatched, they require adequate living space. A minimum size of spawning tank must be 24 x 12 x 12 inches (60 x 30 x 30cm) though, obviously, a larger size is better. Most serious hobbyists would not consider using anything smaller than a 36 x 15 x 15 inches (90 x 37 x 37cm).

A heater to maintain a constant 70°F (21°C) should be added, while strong aeration will circulate water over the eggs, keeping them free of debris, and will encourage the fry to break free of the egg case.

Ideally, the spawning tank should be free from gravel. Anything that is likely to harbour dirt and debris is not acceptable in the nursery tank. Water conditions must remain clean if the fish are to thrive and be

**This young and almost fully developed Celestial has survived all the rigours of a necessary, but upsetting, culling programme.**



free from disease.

A water temperature of 70°F (21°C) will dictate that the fry will hatch between 3 to 4 days. Once they start to emerge, the aeration should be reduced, for goldfish of any age do not like to swim against a constant strong current.

### Feeding the fry (and hazards to watch out for)

Nature will cater for the first 48 hours of life. The fry have an egg (yolk) sac which they consume before searching for their next meal. Liquid fry food, obtainable from aquatic stores, is the first food we should offer. It is good and convenient; a few drops twice per day is sufficient and will not foul the water.

During this first feeding period preparation for larger morsels can begin. Newly-hatched Brine Shrimps are of a size most goldfish fry are able to eat in the first week of their lives. At least two jars, kept on the bubble and producing shrimp, will cater well for even a large spawning. Usually Brine Shrimp is fed until the goldfish fry are about two weeks old and then small *Daphnia* can be fed. However, a shortage of these crustacea may mean that the diet should continue on Brine Shrimp for a longer period.

*Daphnia* collected from waters which do not contain fish is unsurpassable food for baby fish. It gives them all the nourishment they require, inducing an excellent growth rate. The quantities of *Daphnia* required to feed only an average size spawning is staggering, so the idea of home producing enough is totally out of the question. The advantages of feeding the Water Flea means that the fish grow and develop well, and (also important) is the fact that the water is kept clean, without a build-up of harmful bacteria. In fact, the growth rate is so great that it is possible for the baby fish to attain the body size of 1 inch (2.5cm) at four weeks of age.

There are, of course, potential dangers lurking along with a catch of *Daphnia* and one should be aware of them before adding *Daphnia* to a tank of fry.

Small fry are at risk from the *Hydra* which, in itself, is a remarkable creature, first discovered by the Swiss naturalist, Abraham Trembley. These creatures multiply quite rapidly, so as soon as their presence is discovered, fry should be re-

moved to a clean tank and the infested tank cleaned out with warm water and a stiff brush (the type normally used for washing up is most useful) and left to dry out.

A most ferocious predator often brought in with *Daphnia* is the larva of *Dytiscus* (Great Diving Beetle). The larva grows to 2in (5cm) long and has powerful mandibles to seize its prey. On doing so, it pumps a digestive fluid into its body and the dissolved solid contents are sucked out, leaving an empty skin. Small, and quite large, fish are in great danger from this particular predator.

Collecting *Daphnia* from waters which contain wild fishes runs the risk of also including *Argulus* (or Fish Louse) in the catch. This is a round, flat creature which can attain a size of about 1/2in (1.2cm). It is transparent, easily mistaken for a fish scale and difficult to spot on the nacreous types of goldfish.

One point in the fry's favour is that carp fish lice are normally unable to survive long in warm water. Because these creatures are relatively large, they can be removed from a fish with forceps or rubbed off with a tissue while holding the fish in a wet cloth or net.

Leeches are worm-like but have a sucking disc at each end. These can also be removed from a fish with forceps.

As the above shows, there are risks involved in collecting *Daphnia*. However, the collector soon gets to know what to expect in his/her catch from each pond or stretch of water and whether the risks are too great from any one source.

Not everyone will, however, have the resources to collect the Water Flea, so a substitute must be found. Cultures of Microworms are a good substitute, though somewhat messy to prepare. Mashed White Worms are yet another answer. There are also many foods on the market; freeze-dried *Daphnia*, *Tubifer* and Bloodworm, which have also proved useful, as well as fine powdered baby fish foods.

The important point to bear in mind while feeding any of these substitute food-stuffs is that they can easily pollute the water, particularly when the water temperature is high, so care and caution must always be shown. Daily maintenance is imperative if water quality is to remain good.

The bottom of the tank must be siphoned as soon as it is possible to do so, remembering that there will be fungused eggs from the

spawning still remaining. It really is impractical to attempt to remove infertile eggs before the fry from the fertile ones have hatched; it is not critical enough to worry about. However, as time passes, they will begin to putrefy and, so, are best removed just as soon as it is possible to do so.

### Space & culling

It will soon be apparent that extra space is needed now that the fry are growing. Experience usually gives us good judgment on safe stocking levels when growing on young fish, but commonsense is our greatest guide, and under-stocking rather than over-stocking should always be the rule.

I personally think that twenty, one-inch fish are the limit in a 36 x 12 x 12 inches (90 x 30 x 30cm) aquarium, but, of course, this is purely a personal preference.

Surplus tiny fry are easily disposed of by feeding them to adult fish. As the remaining fry grow, the process determines that the breeder will have to come to terms with the fact that the culled fry must be disposed of no matter how distasteful the subject might be.

At a certain size baby fish are no longer acceptable food to adult goldfish and, therefore, alternative and humane disposal must be found. This is one subject which gives me as much remorse as the next person. It is not by any means a subject easy to come to terms with.

I normally remove the real runts before they have reached a size of rejection by the adult fish. Later cullings of reasonable size fish can be sold or exchanged for goods at most aquatic dealers or passed on to fellow hobbyists.

Culling is a most important part of goldfish culture, for there will be many fish which will fall short of what can be acceptable. Mis-shapen individuals and those that do not develop the correct number of fins in the fancy breeds take up valuable space needed to rear the better specimens.

Unless the breeder has unlimited space and resources it is impracticable even to attempt to raise many of the young, particularly if they belong to most of the exotic varieties, for among these types, few will be of great quality. So, the best should be given all the space you can afford, otherwise they will be unable to make good progress and this will have disappointing, if not disastrous, results.

If the eyesight is good (and depending on experience, of course) the baby fish should be large enough to commence culling at two or three weeks of age. The first to go will be those which are mis-shapen; the more exotic the variety, the more obvious the faults.

The culling process is a long procedure. Each day, as the fish grow and develop, it will be easier to see faults, and this will continue for months, until only the very best remain.

In the twin-tail varieties look for the fry with only a single tail, a procedure best done from above. In Lionhead fry, and others without dorsal fins, there will be some fish with partial dorsals, spikes, or

**A young adult Bubble Eye, well on its way to achieving success as a show specimen.**



PAULINE HODGKINSON

and are the first to be removed.

Colour will be high on the list of priority when sorting nacreous goldfish. Theoretically, nacreous fish will be present in a nacreous x nacreous cross at a ratio of only 50%, with 25% matt and 25% metallic. The matts are pinkish white with black, button-like eyes, making them quite easily distinguishable from the nacreous fry. These are normally discarded as they are unattractive, thus making space for the others. Metallics appear dark and have a reflective sheen. Some of these will eventually change from a dark greenish colour to orange, but will take a long time to do so, perhaps as long as two or three years, so they, too, should be removed.

Even among those remaining nacreous fish, there will be degrees of colour. In the best, depending on the strain and the cross (choice of parents from the strain), the colour could be strong, black, blue, red, orange, yellow, violet, or even silver and brown. The worst will be pale and wishy washy, along with those individuals that fall between the two. Then, depending on the numbers and the space available to grow them on, a selection can be made from the better-coloured fish.

Culling the fish will continue throughout the season, the finer points, or lack of them, revealing themselves as the fish develop and grow. It is much better to have a small number of strong, healthy, well-developed fish at the end of the season, than a large collection of sickly, stunted, specimens to show off the season's work.

### Tank care and health factors

Clean tanks must always be ready so that the fry can be spread out and given room to develop. Disease is always waiting to overtake fish that are kept in crowded conditions. Additionally, they cannot thrive or grow well if they have restricted swimming space.

The water in the clean tanks should have been allowed to stand for a couple of days before the transfer. It should also be aerated and brought to the same temperature as the fry tank.

The number of fish will determine at what stage they should be moved. It may be necessary, spacewise, in their first week of life or at a later date. Concern about what adverse effect the moving of fry so young might have is generally unfounded because, in spite of their delicate appearance, only few will come to harm. However, it is prudent, when moving baby fish, to place a shallow dish into the tank, herd some of the fry over the dish with a net, lift the dish, water and net with the fry from the tank,

quarters. By this method they never leave the water and are not accidentally injured by the net.

The original spawning tank can (once the fry have been farmed out to new quarters) be cleaned out and re-filled to be put back into use at a later date.

Daily tank maintenance should then continue. Carefully siphon the bottom and top up the level with water of approximately the same temperature, changing about one quarter of the total tank volume each time. The fry seem to benefit from a complete water change about every two to three weeks, but it is wiser to allow new water to stand for approximately two days before the move.

Flukes are pests which can do untold damage to a batch of tiny fish, particularly if they are kept in crowded conditions. Gill Flukes (*Dactylogyrus*) and Skin Flukes (*Gyrodactylus*) are serious pests for they fill up the gills, preventing them from working and, in consequence, will eventually drown the fish.

There are several proprietary preparations on the market. In addition, many experienced hobbyists rely on an old stand-by in the form of a weak Dettol bath. The young fish are placed in a net and dipped into a solution of one teaspoon of Dettol to one gallon of water for twenty seconds and are then released into clean tanks.

As a secondary treatment Methylene Blue can then be added to clean tanks. Methylene Blue is added to the tank until the water takes on a medium-to-dark blue colour. The fish must be easily visible through the medication. The base of the treatment tank must be siphoned daily and clean water and medication added to maintain the depth of colour and replace the drawn-off water.

Using separate nets for each tank is a very good idea so that, should disease break out in any tank, it will not automatically pass throughout all the fish population.

The water temperature should be maintained at about 70°F (21°C) until the youngsters are somewhere in the region of 2 inches (5cm) body size. At that stage they should be large and strong enough to withstand natural temperatures. Of course, this should be a gradual introduction because our summers can be rather unpredictable, with night-time temperatures often falling quite low.

### Closing remarks

The successful rearing of top-quality goldfish is a long and patient process which is involved, exciting and satisfying. I hope that my comments and suggestions prove helpful to the reader. Good luck!

# Spotlight

## THE ORANDA

Despite its well-deserved popularity, the Oranda is still a challenging and "controversial" fish, as Stephen Smith reveals.

Photograph reproduced by courtesy of Macho Ranchus (Singapore).

**T**here can be no doubt about the appeal of the Goldfish. Some prefer the Lionhead, with its smooth dorsal-less back and characteristic "hood"; while for others, the flowing finnage of the Veiltail, or the lively Fantail, provide the greatest attraction.

Yet, one particular strain of Fancy Goldfish incorporates several of these characteristics to stand out as one of the most admired and popular of the fancy varieties of Goldfish: the Oranda.

A good quality Oranda is one of the most beautiful sights for any fishkeeper — and even for those yet to discover our most pleasurable pursuit of fishkeeping.

And, testimony to the popularity of the Oranda, several strains and variations have been developed over the past decade or so, resulting in a broadening of appeal and fresh challenges for the enthusiast.

The principal characteristic of the Oranda is the "hood" — a fleshy development around the head and eyes, similar to that of the Lionhead.

However, unlike the Lionhead, the Oranda features a full complement of finnage, whether in the traditional Veiltail form or the increasingly popular Fantail variety.

At this point, the purists fling up their arms in horror — how can an Oranda be anything but a Veiltail or Broadtail variety? ...!!

However, it is becoming increasingly evident that the modern Oranda exists in two distinct types: the traditional Veiltail/Broadtail varieties, such as the Golden, Calico, or Red-and-white; and the Fantailed Orandas, such as the Chocolate and Blue Orandas and the Redcap.

Further deviations from "traditional" include the Black Oranda and even a Chocolate Pom-pom Oranda. However, the success of the strains furthest removed from the traditional types depends very much on the diligence and enthusiasm of breeders: quite simply, if they are not bred and refined year

by year, and new lines created and consolidated, their chances of survival will, inevitably, be limited.

### Veiltailed Oranda

Connoisseurs of the traditional Oranda strive for the flowing finnage which is characteristic of the Veiltail. The dorsal fin should be well-developed, have a clean outline, and be held erect, while the caudal fin should be long and flowing, and fully-divided.

The topmost rays of the caudal fin should form a smooth downwards curve from the caudal peduncle, causing the rays of the finnage to "gather" like a veil or curtain. The lower edge of the caudal fins should appear as square-cut as possible, a characteristic which is difficult to achieve, as Veiltail varieties will always try to revert back to their Fantail heritage.

The anal fins of the traditional Oranda should also be in keeping with the Veiltailed varieties of Goldfish, being also very well-developed, so much so, that in some cases, the anal fins protrude through the split in the tail!

Naturally, pectoral and ventral (pelvic) fins are fairly long and virtually pointed, providing a balanced appearance to the fish.

The traditional type of Oranda is seen in three main types: Golden metallic, the multi-coloured "jewelled" appearance of the Calico Oranda, and the Red-and-white Oranda.

Until recent years, the golden colouring was the type more often seen, even if occasionally a little pale, while calico and red-and-white varieties are now becoming more popular.

### Fantailed Oranda

With the Fantail varieties of Oranda, it is heartwarming to see more and more Chocolate and Blue Orandas and the Redcap on the showbench around the UK.

Specialists of these varieties try to achieve a shorter finnage: the pectoral, pelvic, and anal fins are more rounded and the dorsal

fin, while still cleanly formed and erect, should not be over-developed.

Turning to the caudal fins, again these should be paired, and the topmost rays as strong and erect as possible. This "fans out" the lower rays to form an attractive "V" formation.

With either variety, good examples of finnage are difficult to achieve: Veiltails will always produce "failed Veils" (often seen for sale as children's pets), while drooping or over-developed finnage will always occur with the Fantailed Orandas.

Returning to the "hood" characteristic, it is an anomaly of the fantailed versions of the Oranda that they seem to produce a lesser developed hood, which is often confined to the top of the head.

However, in the case of the Redcap, the hood development is desired **ONLY** at the top of the head, and it is arguably this variety which offers the greatest challenge to the specialist breeder.

Not only does (s)he have to contend with ensuring that (s)he meets the desired characteristics of finnage, potential hood development, and body-shape, but the distinct scarlet red disc should be confined only to the part where the hood will develop — if at all!

Few people realise that Redcap spawnings throw mainly all-pink fish, with a number of red-and-white versions (not to be confused with a true-bred Red-and-white Orandas), and a very few, if any displaying the correct colouring.

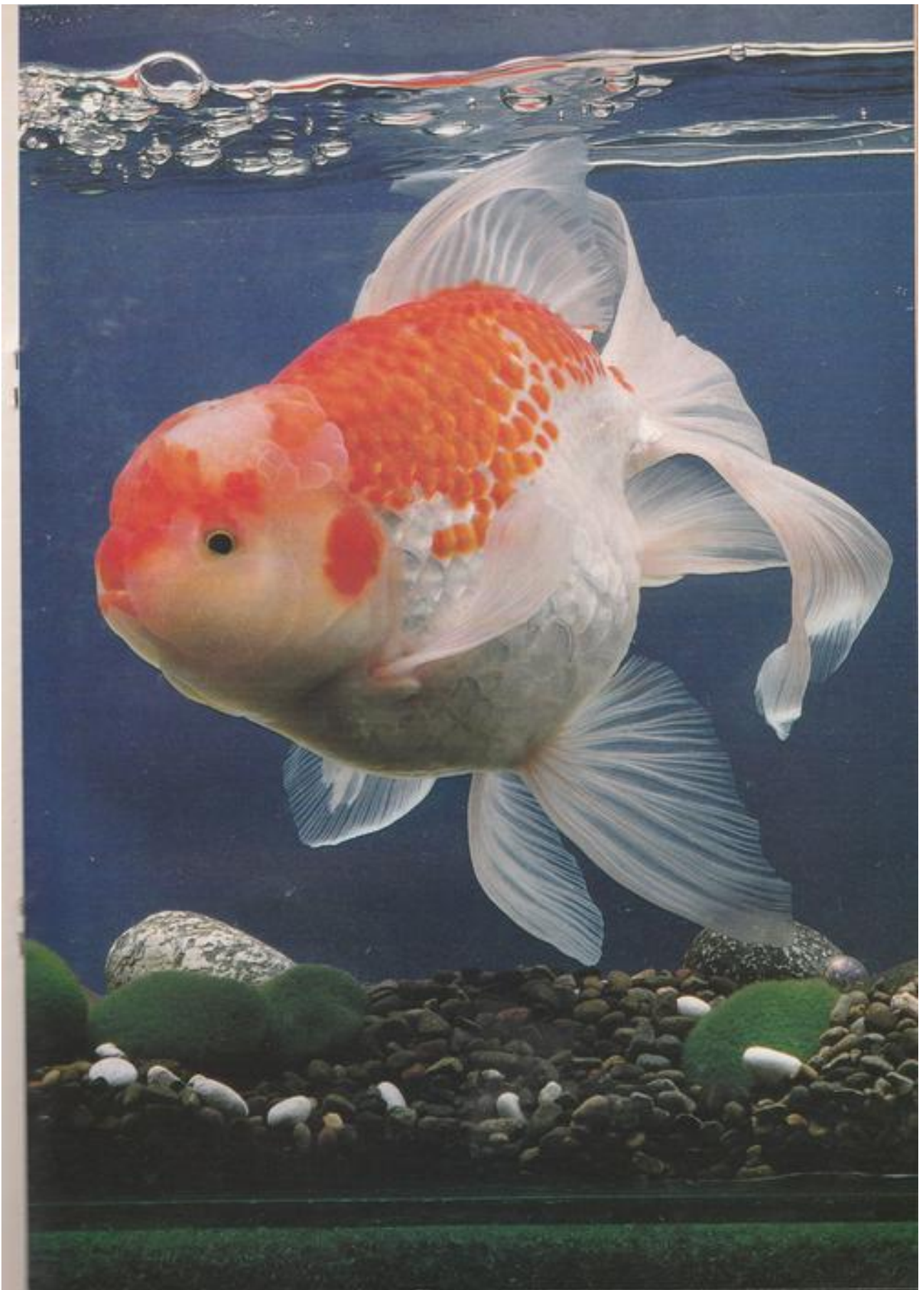
Such an extensive challenge has meant that few good quality Redcaps are generally available. Quite simply, it is not economical for commercial breeders to devote the enormous resources required to develop such strains in any quantity.

Despite this, good quality Redcaps are seen at the major goldfish society shows, while Bristol Aquarists' Society has 'over recent years' recognised the fantailed varieties of Oranda by introducing a separate show class: "Orandas: Redcap, Chocolate and Blue".

Such fish otherwise stand little chance of achieving anything like the show points they deserve if competing against their Veiltail counterparts.

This is a cause for concern for some specialists, and it is to be hoped that more societies and associations will recognise the growing demand for the Fantailed Orandas over the coming seasons.





# CASEBOOK

Jerzy Gawor examines the second case in this occasional series on fish disease diagnosis.

Client: Miss C.W.

Case No: 0870412

Specimens: 100ml. pond water

4 small dead Koi

2 medium live Koi

## Background:

One bright and sunny spring morning a rather distressed young lady turned up asking if 'this was the place that analysed dead fish to see what they died of'.

On confirmation of this, she disappeared out of the front door to her new Golf GTE car, and promptly reappeared with three buckets of assorted fish, water samples, plant samples, bits of rock, a list of the other pond fish, details of the pond, and, in fact, any and all information she felt would be of value in aiding my diagnosis. This indeed showed a lot of foresight, as often, all I receive is a semi-dried fish specimen and scanty details of the system it was kept in.

Miss C.W. seemed a very sensible and methodical person, who felt she had done as much as finances would allow to provide a nice pond for her collection of small to medium sized Koi. Thus, it was no surprise to find her at wits' end witnessing the gradual demise of her Koi population over the course of two weeks, and finding herself virtually powerless to diagnose or treat in any way whatever was causing the problem.

Miss C.W. was asked to fill in one of our standard laboratory questionnaires. These have been designed to provide as much background information on the particular problem as possible and highlight important areas such as size of system/numbers of fish/types of filters/frequency of partial water changes/type of food/frequency of

feeding/use of medications/typical symptoms, etc . . .

With the information and samples carefully removed to the laboratory I asked Miss C.W. to return the next day for my report on the situation. Within the hour I was setting up the microscope, instruments, meters and reagents to conduct my investigations.

## Laboratory analysis:

1. Water sample	100ml. Pond water
pH	8.20
Total Hardness	200.00 mg/L (as CaCO <sub>3</sub> )
Total Ammonia	0.00 mg/L
Nitrite	0.00 mg/L
Nitrate	20.00 mg/L
Copper/heavy metal	0.00 mg/L
Temperature (in pond)	42°F (5.5°C)

## 2. Fish Samples:

Several fish samples were supplied. The four small dead Koi had been dead for over 24 hours, were in a partly decayed condition, and, as such, were useless for any serious post mortem study.

The two live fish supplied would, however, supply much useful information, as they were representative of the symptoms and behaviour present in the other fish. It should be pointed out that no harm comes to the fish during the examination.

Miss C.W. described how many of the fish were staying very still in the water, sometimes just below the water surface, and that, much of the time, they would shoal around the waterfall. The fish also showed a 'fungal' growth around the body which seemed to cover the eyes in some cases.

External observation showed indeed that a 'fungal' growth was covering areas of both fish supplied, but experience told me that

this was no more than excessive mucus being secreted by special skin cells. In addition, the eyes were very cloudy on both fish and slightly sunken, the fin tissue was opaque, and there was a general marked reddening of the skin caused by haemorrhaging of the very fine capillary blood vessels supplying the fish's skin.

An examination of the gill cavities showed the edges of the gill-filaments to be light pink in colour, and heavily clogged with mucus.

Microexamination of skin scrapings (wet mount) showed severe infestation with Ich (White Spot), *Trichodina* and *Chilodonella* protozoan parasites. It should be noted that, often, the defined tiny white spots that are characteristic of Ich infestation in tropical fish, don't occur in pond-fish. Whether this is because coldwater fish have greater ability to secrete mucus (which masks the effect) is not clear, but this does seem a plausible hypothesis. No fungal hyphae were observed, which confirmed my earlier observations on there being mucus only and no 'fungus'.

Mucus taken gently with a cotton swab from the gill cavity and 'wet mounted' on a microscope slide also showed many parasites of the species found on the previous slide.

As the fish were alive, and my experience told me nothing more was to be gained by sacrificing one or both for internal observations, they were quickly removed to a quarantine tank and treated accordingly.

## Conclusion and diagnosis:

The high level of parasites found would account for the excessive levels of mucus. This is copiously secreted by the fish in a vain attempt to 'slough-off' the offending

Left, sunken eyes and "lightening" of the gill edges (brought about by damage to tissues and excessive mucus production) often go hand in hand in heavily infested fish. Right: general reddening of tissues is caused by haemorrhages from fine capillaries.



JERZY GAWOR

JERZY GAWOR

parasites. Regrettably, in a closed system, the numbers of parasites multiply very rapidly causing re-infection. The mucus continues to be produced resulting in severely congested skin tissue and gill cavities.

It is also my belief that the fish are dehydrated by the constant loss of water as mucus. Often, a hollow condition is observed in such fish, together with sunken eyes.

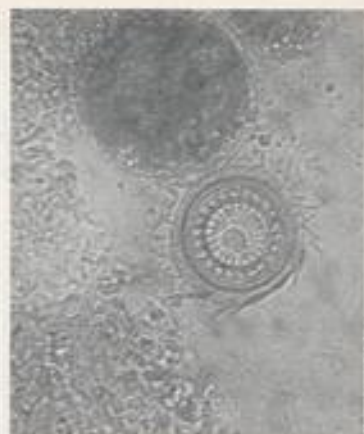
Death of the fish is caused by loss of gill function through mucus clogging, and gill-lamellar damage, as well as through physical damage by the parasites, and, of course, shock.

As the water conditions in the pond were optimal and no new fish had been recently introduced, it was concluded that a reservoir of parasites had built up in the pond, and as tends to happen in many instances, the fish succumbed to infestation while at their weakest time of the year i.e. the transition from winter inactivity to the warmer spring months. (N.B. at this particular time, fluctuating weather conditions would have placed a greater stress on the fish and further aggravated the situation).

#### Recommendations:

My immediate recommendations were as follows:

1. Prepare a large container of pond water of sufficient size to hold two to three fish comfortably for a short while.
2. Add 8 oz. of salt (cooking salt or pure salt) to every gallon of water in the container. Dissolve well.



Delicately structured *Trichodina* and less distinct *Ich* (White Spot) parasites from a skin scraping taken from a Koi.

JERRY GANNON

3. With the aid of a timer, dip each fish into the salt solution for exactly two minutes. Immediately, return the fish to the pond holding the fish gently until it swims away.

4. Having salt-treated all the fish, treat the pond with a proprietary formalin and malachite green water treatment.

5. Repeat the salt bath, if necessary, after 4 days.

Miss C.W. reported back to the laboratory after a week saying that no more fish had died and that the improvement in the fish was almost unbelievable. Three weeks later

you wouldn't have thought that there had been a problem in the pond.

#### Preventative measures:

Some points in this case are fairly typical of many cases I have seen at the laboratory and, hence, take note of the following:

1. Never allow a disease/problem situation to progress for any length of time (2 weeks in this case). If you feel something is wrong seek professional advice **immediately**. Things rarely get better if left alone.

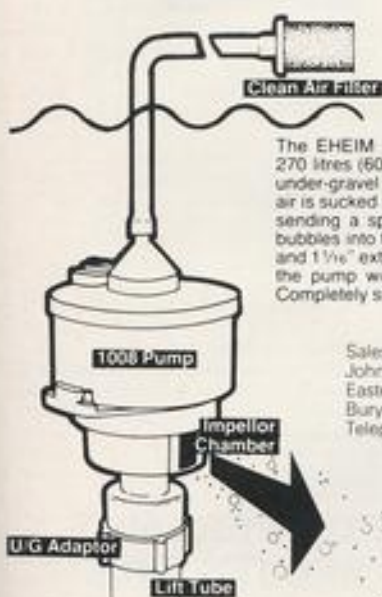
2. Treat the pond in the early spring with a proprietary formalin/malachite green treatment and, thereafter, two or three single applications during the pond season. This helps markedly in keeping the levels of common fish parasites down, and does no harm to the fish, plants or filter bacteria.

3. When purchasing new pond fish it is important to check carefully what you are buying. If possible, quarantine new stock for 2-3 weeks before adding to your pond. If this is not possible treat the pond with formalin/malachite green.

#### Postscript:

Miss C.W. is moving house and has already agreed plans for a new and larger Koi pond for the larger garden. Her boyfriend is going to be working with a pick and shovel for quite some time judging by the dimensions!

Once Koi are part of your life it is impossible to live without them. Wonderful, isn't it?



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The 1008 can be used without the air facility if desired. Ideally, the pump should be mounted a clear 2" below the water surface. If nearer the surface, an airline clamp **must** be used to reduce the density of air entering the pump. This is to prevent the possibility of air driving water partly out of the impeller chamber and causing the bearing to become dry and hence noisy.

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**T**his small and attractively coloured cyprinid is indigenous to the swift flowing and stagnant waters in and around upland regions near the city of Canton, China.

Although this part of eastern Asia lies within the tropical zone, it is not surprising, taking into account the altitude in which it is found, that an unheated tank kept in a normally heated living room suits White Clouds better than a typical tropical aquarium.

Incidentally, for more than forty years, observant hobbyists have not been slow to note the ability of the fish to tolerate low temperatures without harm. For instance, a fascinating account of its hardiness under trying conditions appeared in the issue of this magazine dated December, 1969. It was contributed by one Günther Radek, writing from southern Germany.

In May 1967, he introduced 15 fry of 5mm body length into his 12ft x 15ft x 3ft garden pond. Its sub-aquous vegetation consisted of filamentous algae and curly leaved Water Thyme or 'Densa' (*Lagarosiphon* sp.). 'Except for some Dragonfly larvae the pond was free of creatures,' Herr Radek explains. 'Water temperature was about 20°C.' Later, it turned colder and 'temperatures dropped to 15°C... even to 10°C.'

In July, temperatures returned to seasonal normal and a dozen well-grown adult fish were netted before summer was out. Naturally enough, the presence of too many predatory insect larvae accounted for the small number of fish retrieved; a fact acknowledged by Herr Radek.

Anyway, during the late spring of the following year Radek launched an all-out attack on Dragonfly larvae and reduced their numbers. He then released another batch (some 300) of tank-raised White Cloud Mountain Minnow fry into the water. Unfortunately, a series of bad frosts occurred in the early autumn and the pond received coatings of thin ice. For all that, 28 adult fish were recovered from the pond. He says that they were bigger and more brightly coloured than any specimens he had seen before. From this testimony, then, there is every reason to emphasise what a remarkable and most adaptable species the White Cloud Mountain Minnow (*Tanichthys albonubes*) is.

The Chinese ichthyologist Lin-Shu-Yen first described the species in the *Lingnan Scientific Journal* in 1932. He named it, says J. J. Hoedeman in his *Naturalists' Guide to Fresh-Water Fish* (Stirling Publishing Co., Inc., New York, 1974) after a fellow countryman called Tan. This explains the fish's generic name (Tan's Fish). Tan found the fish in some stream wending its way about the White Cloud Mountain; hence the species' popular name. Aquarists living in Germany in the pre- and immediate post-war years often referred to it as the Cardinal Fish. Dutch aquarists, in former days, of course, called it the Canton Danio or Chinese Danio.

I first bought a few White Cloud Mountain Minnows in Mayfair, London, in the spring of 1938. The species turned up in



A pair of White Cloud males in full sparring display.

## THE RESILIENT WHITE CLOUD MOUNTAIN MINNOW

Still going strong after so many years, the White Cloud Mountain Minnow receives a timely boost from one of its long-serving fans, Jack Hems.

### White Cloud Mountain Minnow

**Family:**  
Cyprinidae.

**Common Name:**  
White Cloud Mountain Minnow

**Scientific Name:**  
*Tanichthys albonubes*

**Designation:**  
Coldwater and tropical.

**Geographical Distribution:**  
China, around Canton, and Hong Kong (aquarium-raised variety).

**Size:**  
Around 4.5cm (1.75in).

**Water Preferences:**  
Not critical. Temperature range: very wide, from below 15°C (50°F) during winter to normal, but not excessive, tropical temperatures in summer.

**Diet:**  
All foods.

**Breeding:**  
Quite an easy egg-scattering species.

**Notes:**  
Even now, there is still some confusion over the naming of this species which arises out of the existence of two colour variants (some, say two subspecies): one with light edges to the dorsal and anal fins, from Canton, and another with red edges — apparently from Hong Kong. For a time, there was also a long-finned variety.

Germany in the same year. Whether it turned up in German dealers' tanks before it appeared on the English market, I do not know. (Perhaps it is nearer the truth to say that I haven't the energy to wade through stacks of pre-war magazines in order to find out.)

Interestingly, the fish reached Europe by way of Canada and then the U.S.A. The great William T. Innes, in various editions of his once-famed *Exotic Aquarium Fishes*, enthused about the beauty of the fry 'looking like young Neon Tetras.' And indeed they do as they flash about displaying metallic green and red on their sides. When they attain full size — about 4.5cm — their colours are more subdued: the back a lightish green, the underparts a shade of faded white. A red stripe, bordered above by a narrow line of green to blue, extends from behind the eye to a black spot on the base of the tail. The margins of the ivory-to-white based dorsal and anal fins are banded with red. The caudal fin is suffused with red from its root to about the beginning of the twin lobes. Sexual dimorphism is not very marked, but in mature fish the female can be distinguished from the male by her stouter build. Also, apart from the slimmer outline of the male, his fins are almost always redder than those of the female.

*T. albonubes* is a peaceable and strictly non-vegetarian species. In other words, it doesn't eat plants. Thus it makes an ideal occupant for a decorative tank set up for a collection of small and equally inoffensive fishes, happy in temperatures ranging from 20°C (68°F) to about 22°C (72°F). I have

in mind the more easily obtained and harder species such as *Hyphessobrycon flammeus* (Flame Tetra), *H. scholzei* (Black Band Tetra), *Hemigrammus ocellifer* (Head & Tail Light Tetra or Beacon), *Aphyocharax anisitsi* (*rubripinnis*) (Bloodfin), and the ubiquitous Neon Tetra (*Parachanna innesi*).

The White Cloud Mountain Minnow breeds freely. All the aquarist has to do is to place the two sexes in a tank well stocked with thickets of fine leaved plants, and make certain they are well fed. Any live food offered should be small, for *T. alboubes* has a small mouth. Tiny mosquito larvae, Grindal worms and young *Daphnia* fit the bill. The temperature should be maintained at about 24°C (75°F).

When swollen sides indicate that a female is bulging with eggs, and the male exhibits his procreative powers by donning brighter colours, egg-laying will follow almost, if not, immediately, and a pair will make for some favoured area of vegetation. After some trembling and shaking, the female, accompanied by the nudging and butting male, will scatter a few, to quite a number, of adhesive eggs among the plants.

The female swells up with more eggs soon after spawning, and further lashings of passion will occur every now and again over a period of a few to several days. The eggs incubate within the space of two days, and the fry hang on the plants for another couple of days before they detach themselves and go swimming off. They dart to and fro among the plants (invariably those growing along or near the surface) snapping up

The rarely-seen Garnet Minnow (*Hemigrammocypripis lini*) has been the subject of nomenclature confusion in aquarium literature involving it and the White Cloud Mountain Minnow. Although there are certain superficial similarities between the two species, they can be easily distinguished from each other.



JOHN DAVIES

microscopic food, dried or live.

Given rather frequent small meals, the parent fish do not eat many, if hardly any, of their eggs or young, and the youngsters increase in size at a rapid pace. Ordinarily, they are well-sized before five or six weeks are out.

But, to return to Hoedeman. In his reference to the Canton Danio or the Chinese Danio as popular synonyms given to the White Cloud Mountain Minnow, he also makes a mention of a Hong Kong Danio, which he tells us bears a close resemblance to *T. alboubes* (I presume he means in size, coloration and general outline).

This cyprinid — not a *Brachydanio* or *Danio*, as he goes on to inform us — was

described for science as *Hemigrammocypripis lini* (Weitzman and Chan, 1966) (formerly *Aphyocypripis pooni*). If this fish has reached the trade, I cannot remember having come across it in dealers' tanks or in the pages of the fishkeeping magazines I see.\* Fortunate are aquarists who may have come across this fish in their journeys here and abroad, and in their reading.

Be all this as it may, there is no question that *T. alboubes* is one of the most praiseworthy small species for the beginner or experienced aquarium keeper to obtain for the sheer joy of keeping it.

\**Hemigrammocypripis lini*, although extremely rare in the hobby, has been recorded often enough to be given a common name, the Garnet Minnow.

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# Koi Talk

by John Cuvelier



JOHN CUVELIER

## Are you ready for the Koi season?

As you sit reading this and contemplating, more than probably, the vagaries of our British climate, bear in mind that a new season of Koi-keeping is only just around the corner. Are YOU ready for it?

As our pools awake from their winter slumber (?), the annual task of getting things going will obviously entail a certain amount of water changing. This train of thought was set off by a letter I received from a young lady in the Severn Trent Water Authority area following my 'Tale of Two Chemicals' (Dec. '87 A & P).

She related a somewhat sorry tale of woe regarding chemically tainted tap water and fish losses resulting from mains purging, etc. Unfortunately, it is a fact of life that when water supplies become affected with water shrimp, etc., rapid action needs to be taken in order to protect us vulnerable humans, pet fish being very lowly placed in the water undertakings' list of priorities. I can only reiterate my earlier warnings regarding constant vigilance and frequent water testing, prior to, and during, any water changing operation.

In my reply to this lady, I did suggest that contact be made with the local Fisheries/ Amenities Officer in the water undertaking, as it is possible to strike a rapport with the majority of Officers who, from my own experience, are very approachable and from there, perhaps organise a 'hot line' for warnings of mains purging, and allied activities. It's a line of

attack I can recommend to all.

I also suggested another option particularly suitable for the smaller pool and indoor aquaria. A container of a size suitable for the estimated quantity of water used during water changing can be filled with tap water and treated with 'HYPO' (easily obtainable from chemists) at the rate of 1 gramme per 50 gallons. This will safely dechlorinate water and will not harm fish.

## Buy wisely

Continuing with the theme of a new season, this is the peak period for the stocking of new pools with fish. Now, I know all about impatience; I've been there too, but please do take your time in selecting your fish and try to wait until later in the season, unless you are certain that your prospective pets have overwintered in this country. You could save yourself a lot of heartbreak.

Many newcomers to Koi-keeping are tempted to buy a quantity of small Koi in the hope of growing them on, as opposed to, perhaps, two or three larger and more costly fish. Take it from an 'old hand', it usually proves to be a

false economy.

There is an old saying among the fraternity which goes like this, "The larger the Koi, the more difficult it is to kill", and there's a lot of truth in it! The mortality rate among two to four-inch Koi is quite horrific, and even more so when they expire in your own pool. And, of course, you get a much better idea of colour, pattern, etc. from a mature fish.

Many first-time visitors to our pool ask the question, "Do you breed your Koi? After the usual joke reply of, "I don't, but the Koi do!", my answer is invariably in the negative, on the grounds that it is too much hassle and, in any case, I could not bear to kill all those dun-coloured little fish simply because they won't ever be pretty.

Unless you go in for a discrete spawning set-up using properly matched males and females, to be followed up by intensive rearing facilities, the job just isn't worth it. Leaving it to nature and just removing a selection of eggs from your pool (if you're up early enough) will simply result in a hatch of the aforementioned dun-coloured fry, hundreds of 'em at that! Be prepared also for a

great number of deformed tiddlers among them; that, I can guarantee. I have to admit to taking the easy way out and leaving my Koi to enjoy the fruits of the frolicking which will take place when conditions are right. Well, it's good protein for them and they have a heck of a lot of fun going round sucking off all those eggs from plants.

Having said all that, I'm not denying that it's good fun to rescue just a few eggs to hatch out, and there is always the chance that you might be lucky and end up with a batch of nicely coloured Koi, but it is strictly a lottery.

## Accessories with a difference!

Around about this time each year I begin to scan the advertisements to see what wonders are being launched to assist us in our search for the ultimate in fish care accessories. If we were all millionaires, and IF we believed everything we read about, what a marvellous time we and our fish would have. Sadly, life just isn't as simple as that, is it?

Personally, I try to take it all with a pinch of salt, but then I've always been a bit of a cynic... but you've probably guessed that already! Still, it does take the edge off disappointment when things go wrong.

If you have the space and nerves of steel, you could do what I did and add a really useful accessory to your pool. All you do is to pop along to your local wildfowl sanctuary and purchase a pair of ducks! They will provide you with additional colour on the surface of the pool, a lot of fun watching their antics, and the chance to thin out your hair as you tear it out by the roots every time they get in among your water plants. Trouble is we've grown to love 'em, and what's more, you have not lived until you've watched a pair of ducks cruising across your pool followed by a veritable flotilla of Koi in line astern, obviously fascinated by the twinkle of four bright yellow feet! What will happen when we are blessed with the arrival of a family of twinkling little feet, time alone will tell!



"Dilly" and "Dally", our "accessories with a difference", in charge of our Koi pool. (See Accessories with a difference!)

## COMPETITION WINNERS

### Minireef Competition winner

We knew that Minireef Systems were popular with A & P readers. What we didn't know was how popular they were. Well, your staggering response to our January competition answered that question in the most decisive way possible. In fact our Minireef Competition has turned out to be one of the most spectacularly successful ones we have ever run! The extremely lucky winner of a Minireef H39 System, plus added extras, with a value of over £500 is: Mr P. Wlodarczyk, 129 Waverley, Grove Hill, Hemel Hempstead, Herts HP2 6DH.

The correct answers to the four questions were: 1. Dr. Johan Blok, 2. Double layer spiral filter, 3. Minimal maintenance, 4. Dallas. Congrats to Mr. Wlodarczyk! Congratulations to our losers. Finally sincere thanks to Minireef for sponsoring such a successful competition.

## Coldwater Quiz apology

There should have been three Coldwater Quiz winners in our announcement last month. Somehow, Mr J. R. Parsley-Martin, Little Bishops, The Street, Heyworth, Diss, Norfolk IP22 2PS slipped through our net and never got a mention. Our apologies to Mr Parsley-Martin who will shortly be receiving the first of his 12 Free copies of A & P.

# Books

## Salamander's Next Best-seller

The Interpet Encyclopedia of the  
Marine Aquarium

By: Dick Mills

Published by: Salamander Books

Distributed in the pet

trade by: Interpet Ltd.

ISBN: 0 86101 306 9

Price: £12.95

They've done it again! The Dick Mills/Salamander combination has produced a cracking book which, without doubt, is destined to become a best-seller among tropical marine aquarists.

In true Salamander tradition, this value-for-money book is packed with colour from cover to cover and is laid out in an attractive and readable format, covering all aspects of setting up, maintenance, health, feeding, and selected aquarium species of fish and invertebrates.

At the end of the day, though, it's not the packaging, but the content, which really

determines how useful, or otherwise, a book turns out to be. And in this department, Dick Mills has done the publishers proud (given his brief).

His no-nonsense, readable and informative style is as praiseworthy as ever. Backed by a panel of well-known figures, such as Dave Keeley and Terry Evans (Consultants), and Peter Scott and Dr C. Agius (Specialist Advisers), Dick has produced a very thorough overview of tropical marine aquariumkeeping in all its aspects.

The *native* marine side, however, represents one of my two minor reservations. As we've come to expect from most books dealing with marines, the "native" side of things does not get the exposure it deserves. Some publishers may argue that this is a true reflection of its relative popularity. Yet, how on earth are we going to get native marines established without producing the literature to go with this type of aquarium-keeping? Four pages (excellent though they are) are hardly going to set the "native marine world" alight.

My second slight disappointment concerns the classification of various species at family level. I would have liked either a more up-to-date grouping or, at least, an explanation or statement establishing whose



## From researching nature.

### DoroMin foodsticks Less waste... more natural goodness

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Rich in protein, DoroMin foodsticks are ideal for larger fish such as cichlids, catfish, barbs, and sharks. And they're economical, with minimal wastage which also solves the problem of water pollution caused by uneaten fragments of conventional food.

# Tetra



Tetra Fish Care, Mitchell House, Southampton Road,  
Eastleigh, Hants. SO5 5RY



classification is being followed. Nelson, whose "Fishes of the World — 2nd edition" is regarded by many as representing about the most comprehensive classification around, includes certain details that I would have wished to have seen in *The Encyclopedia*. For instance, the Moorish Idol is now regarded as belonging within the family Acanthuridae (the Surgefishes); the Puffers are now generally considered as two subfamilies: the Tetraodontinae (Puffers) and the Canthigasterinae (Sharp-nosed Puffers); Sweetlips are now within the family Haemulidae which also includes the Grunts, themselves, formerly classified as Pomadasysidae; similarly, the various Batfish are no longer held to constitute a separate group, but form part of the larger family, the Ephippidae (Spade-fishes).

On the contents page, the Butterflies appear as Pomacanthidae and the Angels as Chaetodontidae (a typesetting

slip-up since the text on page 84 is correct).

What, you might ask, has all this to do with the practicalities of aquariumkeeping? The answer, of course, is absolutely nothing at all. At least, not with the practical side. It does, however, have something to do with the background information side of things

which I tend to rate rather highly.

This does not, however, detract one iota from the value of this book which, in my opinion, is beautiful to look at, is a delight to read, and represents yet another significant and commendable achievement by Dick Mills.

John Dawes

## NEXT MONTH

Traditionally April marks the start of the coldwater and pondkeeping season. We celebrate both events in style with:

## INTERPET

● A special 16-page *Interpet Guide to Pond Care and Maintenance* — supplied FREE on the cover of every copy of *A&P*.

● The latest of our comprehensive and illustrated supplements — this time aimed at the more experienced coldwater aquarists.

In addition, of course, there's a whole host of other attractions for all types of aquarists and pondkeepers — and there's something for herpetologists, too.

Then there's Part 2 of our superb £2,000 **Lahaina KAILUA Competition**. Make sure that you enter part 1 in the current issue (See page 13) of *A&P* to qualify for part 2. Win this competition, and you'll never look back.

Finally, there are our regulars — always sure to be interesting, enjoyable and informative and sometimes controversial. Join us next month. Order your copy of *A&P* early.



# ...naturally better foods!

## TetraRuby

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It's yet another example of the intensive Tetra research and development programme that is unsurpassed in the world.

For further information, or assistance with any fishkeeping problems, contact the Tetra Information Centre, Mitchell House, Southampton Road, Eastleigh, Hants., SO5 5RY.

Always ahead with the best ideas... naturally.





# OUT AND ABOUT

with John Dawes

## Aquarium day at London Zoo a great success

Although the date seemed ominous (13 December), only two groups of people were destined to be disappointed at this event — those that were unaware of the occasion, and those who left it too late to get tickets. The fortunate 200 or so who crowded into the Meeting Rooms were in for a very complete day centring around fishes.

On arrival, a warm cup of coffee and equally warm smiles of welcome soon dispelled the chill of the December morning. Prompt on 11.30am, Dr David Ford, of 'Aquarian', swept us all around the world of fish-keeping, beginning and ending his lightning tour in the Far East (the chief supply centre of our freshwater aquarium fishes) having taken in European and American Public Aquaria on the way. His talk was highly entertaining, and delighted the audience, most of whom were not 'hard bitten' aquarist society members but family groups eager to learn more about fishes.

Just before the lunch interval, a very interesting film was screened, showing the life cycle of the Salmon and how conservationists are now only just beginning to get to grips with the factors (usually man-made) affecting this marvellous fish's very existence. Needless to say, the 'Survival'-made film was beautifully made with plenty of close-up action shots of both the dangers and the joys of the Salmon's complex life.

After lunch, Dr David Pool, of the Tetra Information Centre, presented a very practical look at maintaining Fish Health. Dividing his talk up into three parts, Diagnosis, Treatment and Prevention, he made the whole complicated issue, not only seem immediately comprehensive, but also simply a matter of common sense.

To complete the talks sessions, our host Dr Chris Andrews presented an overview of the past history of the existing Aquarium and a look at plans for the new one. It was most interesting to hear these.

After a Raffle (generously

supported by Salamander Books), during the afternoon coffee break there were information displays to see, and a pre-publication date chance to see Salamander's new and excellent *Encyclopedia of Marine Fishes* by Dick Mills (reviewed in *A & P* this month).

Then came the real highlight of the day, a leisurely visit to both the front and the back of the Aquarium, with the inquisi-

tive youngsters leading the way with questions as usual.

At the end of it all, a tired, but very happy, Chris Andrews said he was most encouraged by the response from the public (as opposed to the expected 'fish-nuts'), the 'sold-out' signs having come very early so that last-minute advertising was not needed. He hopes that a similar 'Aquarium Day' will be arranged early in 1988, so all the disappointed

people out there this time will have a chance to catch up with the exciting developments that make up fishkeeping on both the small and very grand scale. Many thanks to all concerned — Roger Ellis the projectionist, Elspeth Chaplin assistant to Dr Andrews, the Zoo's Press Office and, of course, to the patient and very co-operative Aquarium Staff who stayed on longer than normal hours for our benefit.

## The latest from Shirley Aquatics

By Dick Mills

Returning to the South from the BAF Show at Manchester via the M6, rather than the cone-clogged M1, provided a golden opportunity to stop off at Birmingham and catch up with developments at Shirley Aquatics.

Since the untimely passing of Colin Roe some six years ago, the premises have been under the management of John and Kim Cook, who have had to admit that Colin's was a hard act to follow.

Tropical species dominate the 'front-of-house', freshwater fishes and plants to the right, marines to the left, books and equipment down the centre. If you have a feeling that you're being watched, as you walk through to the coldwater section at the rear, a look over your shoulder will reveal that the pair of inquisitive eyes belong to the biggest marine Triggerfish you're likely to see this side of the Great Barrier Reef. In the larger, cooler, coldwater area, Koi ponds abound, together with a good display of pond equipment and, of course, Goldfish. Again, something lurks within the comprehensively-stocked aquarium showroom, for in a large marine tank is a very close relative of Jaws — a Nurse Shark, *Ginglymostoma* sp., complete with attendant *Remora*. Fellow tank-mates include a very large *Caranx speciosus* (Jack, *Chromileptes altivelis* (Polkado



Nurse Shark, complete with Remora photographed at Shirley Aquatics.

Groupers or Panther Fish), and what looks like a spare Triggerfish almost the size of the one in the main shop. Further areas include ponds and pond decorations and, should your feet begin to complain too much, there's even a small refreshment area where you can recover.

Much of John's now established excellent reputation comes from dedication, knowledge and sheer hard work — a look 'behind the scenes' revealed a most comprehensive water treatment system and quarantine section — but here John is fortunate in having a collection of very willing young staff; it comes as quite a shock to hear such erudite discussions as to water pH, the merits of ozonisers versus UV sterilisers coming from such young mouths!

John operates a policy of

good honest advice, explaining to each customer exactly what is required and why it is sensible to pay a fair price for quality stock and equipment. Coupled with this approach, is the realisation of the need to advertise in the most modern manner to reach potential hobbyists, and, to this end, the broadcast media of TV and local radio have not been ignored. As John modestly said, "If Colin could see the place now, I think he would be pleased with the way it's going." To end with an awful, albeit slightly inaccurate pun: at the back of every aquarist, there used to be Shirley Aquatics; well, they are still there — waiting for you to call.

Shirley Aquatics, Stratford Road, Monkspath, Shirley, West Midlands B90 4EF (Tel: (021) 745 9387/744 1300).

# Coldwater jottings



Stephen J. Smith

## Blooming ponds!

Once the worst of the winter is eventually over, coldwater fish-keepers can at last discard their close season blues and look forward with renewed vigour to the promise of the coming pond season.

"Will this be THE season when THAT elusive championship winner is bred? Or when that pond paradise planned for all those years will actually become a reality? Or will I really have to face those dreaded algae again...?"

For the majority of pond-keepers, that last question always seems to be the one which brings us down to earth. Even the most elaborate filter systems are no sure-fire guarantee that your pond will be entirely free of algae.

More often than not, though, rectifying the cause of algal growth is a lot simpler than trying to remedy the effects of it.

To survive, algae need sunlight — lots of it. So if you are installing a pond this season, try to site it where it will be in the shade from halfway through the afternoon during the summer months.

If siting is difficult, a shade can be constructed adjacent to the pond. This could be made with ornamental concrete blocks; or a trellis, reiplendent with climbing plants, provides a highly attractive backdrop to the setting.

Alternatively, a method fav-

oured by many Koi-keepers — even those with elaborate filter systems — is to arrange a pergola over the pond. These are easily constructed and, again, provide an attractive feature in keeping with the Oriental appeal of Koi and Fancy Goldfish.

Planting the pond also helps to ensure that algae are kept to a minimum, as plant life absorbs available nutrients in the water, while, themselves, providing the benefit of their own shade.

A newly-filled pond may well become "pea-soup" within a few weeks — or even days. Do resist emptying the water out and refilling, as the process will only start again. However, as the pond plants become established and the pond environment more balanced, the bloom should soon disappear.

And finally, be careful if you decide to use proprietary treatments. I have seen far too many fish killed by far too many people who have failed to read the instructions — until AFTER the carnage!

As I said at the beginning of this piece, rectifying the cause is far more effective than any remedy.

## Ultra bright

While on the subject of clear water in the pond, much has been said about the use of ultra violet filters as part of the filter system.

I have no doubts at all about their effectiveness, not only in curing algal blooms but also in ensuring that water returning to the pond is absolutely disease-free.

Such equipment is somewhat

beyond the reach of the average hobbyist, however, though ultra violet filters are proving increasingly popular among wholesalers and retailers of pond fish, particularly Koi.

There can really be no doubt that any establishment should be praised for any investment which ensures that its fish are as healthy as possible.

However, according to several of my Koi-keeping colleagues there is, unfortunately, one overriding danger from the use of ultra violet filters.

The problem, they say, lies in the change of conditions when a fish arrives at its new owner's pool. Having become accustomed to almost over-sanitised conditions, the change to the conditions of the average pool can lead to severe stress and subsequent ailments.

The fish has little or no defence against parasitic or bacterial attack — especially if it has been raised throughout its life under the sanitised conditions provided by ultra violet filtration.

The remedy is, as always, do make sure that you thoroughly quarantine every fish you buy, before releasing it among your existing stock.

My personal golden rule is at least two months' quarantine, in a separate pond or as large a tank as possible. Thus, regular checks can be made of the condition of the fish, including behaviour such as feeding. Any outbreaks of disease which occur (and this can often be the case) can be quickly detected and treated.

When the time comes and you are satisfied that your re-

cently-acquired fish is "in the clear", only then release it to join its new "stablemates".

## Pond with a difference

The idea of a pond INSIDE the house is one which has obvious appeal for the average coldwater hobbyist.

So I was delighted to be able to obtain a most attractive aquarium/indoor pool from a retailer who had used it for display purposes. As it was very much "second hand" I was able to part with far less of my hard-earned cash than for a new model — and it must easily rate as one of my better purchases!

The set-up is manufactured entirely of glass, including the stand and two glass troughs for houseplants.

Such a combination — of aquatics and horticulture — provides a pleasing feature in a once-dark corner of the living room. (I have to stress that this is the only aquarium allowed indoors...!)

A pendant light suspended above the set-up is operated by its own pull-cord switch to provide more than enough illumination from a standard 60 watt spotlight. This also serves to promote sturdy growth of the houseplants.

One, albeit minor, drawback is that there is a substantial loss of aquarium water through evaporation. This is, however, easily overcome with a rigorous routine of substantial water changes every week.

Filtration is provided by an effective combination of an undergravel system, powered by a conventional airline, and a small power filter hidden in the corner of the aquarium behind a frosted glass screen which, I would assume, provides extra strength to the structure.

And no, I have not forgotten the tank occupants at all. A selection of just two of my favourite Fancy Goldfish (a pair of Lionheads are chasing furiously at present) provide the perfect complement to the set-up, which never fails to receive a great deal of interest from even the most dis-interested of visitors.



A very pleasant indoor pond setting is provided by this unusual all-glass aquarium (see "Pond with a difference").

# Naturalist's notebook

By Eric Hardy

## MAFF Research

Last year MAFF spent £1,252,400 researching fish-culture and diseases in this country, as well as a further £286,400 on salmon and freshwater fish biology, fish passes, eel stocks and the introduction of non-native fish. Aquaculture has expanded so much in Europe that fears of disease epidemics in crowded fish stocks are being realised.

The salmon parasite *Gyrodactylus salaris*, reported to be spreading disastrously among wild stocks in Norway, has not yet been found in Ireland. It is introduced by stocking from infected hatcheries.

Vitamin E deficiency has made pancreas disease a serious problem in Scottish salmon-farms.

Improved techniques for marking salmon, instead of the old tags, include a coded, magnetised, micro tag only 1mm long, half this for tiny fish. Inserted in the snout of hatchery salmon before release, it has been used in many British rivers. As radio-pulsing tags cannot signal through salt water now, combined high-frequency transmitting and sound-pulse tags in an estuary are picked up by estuary buoys, which translate the sound by radio signal to autonomous listening stations on the bank. These, in turn, also pick up signals from fish moving upstream. Thus, sound and radio are used as the fish pass from salt to freshwater.

Salmon in the Fowey have thus been found to move in and out of estuaries for several weeks of low summer water levels, but remain in the estuary when flows are higher, until flood waters urge them upstream to spawn. A Scottish salmon was tracked for 266 days over 95km.

## Trout sex control

The Government's trout research unit at Sacrewell, Peterborough and its Lowestoft laboratories control sexual maturity, and produce more flesh, by producing stocks of genetically female rainbow trout only.



Whitefish, such as the Gwyniad, Powan, or Schelley (*Coregonus lavaretus*) are now protected under the Wildlife and Countryside Act.

These are converted to functional males by minute doses of male sex steroid hormone in their food when early fry. When sexually mature, these males are used to fertilise eggs from normal females and the offspring are all females.

Female fish are naturally bigger than males, and angling trophies and fatter table-fish are produced by combining the former method with sterilising females and preventing them from becoming sexually mature (which depresses growth), by a mild heat shock or a brief hydrostatic pressure shock to eggs shortly after fertilisation. The shock makes them retain an extra set of maternal chromosomes, resulting in triploid trout with 3 sets of chromosomes instead of diploids with 2, and their ovaries do not develop. All trout farms are expected to switch to these female-only breeding methods.

On the other hand, excessive

handling and confinement on fish farms is reducing the sex hormones in male trout and impairing their reproduction. The eggs of some poor-quality fish fail to develop to the "eyed" stage.

## Radioactive fish

Fishkeepers have been concerned that radioactivity from the Chernobyl fall-out still affects freshwater and pond fish and may be up on previous readings in high altitudes. Recent Welsh measurements in trout were highest in Snowdonia's Llyn Goddionduon, with 1100 becquerels of Caesium 137 per kg and 410 of C 134. In contrast, Lakeland's Eskdale trout had 780 and 300 becquerels respectively. Only slightly affected, Trawsfynydd eels had 520 and 83, rudd 410 and 63, and perch in nearby Llyn Hiraethlyn 1600 and 610, equaling Lakeland's Devoke Water

where the measurements in eels were up on the previous year at 640 and 210.

Though Loweswater's pike had higher counts at 760 and 300, Bala's were measured at only 64 and 29. Chernobyl offset the reduction in recent years of Sellafield's discharge.

## Some plants and animals protected by new Act

Known only from Upton, Barton and Hickling Broad in Norfolk, Hollyleaved Naiad is one of 31 wild plants the Nature Conservancy recommended for protection from collection under the increasingly complicated Wildlife and Countryside Act. Chippenham Fen is one of the only 3 sites in Cambridgeshire for the Milk Parsley, *Peucedanum curvifolia*, sharing the fen with Common Milk Parsley, *P. palustre* which I've seen also at Hickling Broad below Decoy Lane, and Wicken Fen, Barton below Carfield Fen, Fenwick, Woodwalton and Shapruik (Somerset). Greatly reduced by drainage, Pennyroyal, which I know at Scaynes Hill, Sussex, etc., has also been added.

Coregonid Vendace (Cisco) and Whitefish from deep Scottish, Lakeland and Snowdonian waters were also added, along with Crayfish, and from the seashore, Ivel's Sea-anemone, known only from muddy Sussex lagoons and Starlet Sea-anemone whose only European haunts are along southern England. Also the Medicinal Leech, and all Sea-turtles that stray to our shores — including the Leatherly Turtle which drifted to Hilbre in the Dee last October, showing characteristic head-lifting behaviour.

The British Museum's recorder told me they had then recently had further specimens stranded at Dungeness and Bognor Regis and the Butt of Lewis in the Outer Hebrs. A few Leatherbacks drift here annually from July to December, from either the Mediterranean or Caribbean, and one returned annually for 10 summers hunting jellyfish in Carmarthen Bay.

## Derek

"The flat's not big enough for Dolphins."

