

MAGAZINE[©]

SUMMER 1998

FISHWORLD



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Dear Reader,

First of all may I thank all of you for your kind comments about the new-style "Fishworld". There is still room for improvement, so "onwards and upwards"! Apologies for the reproduction of the advertisements being a little dark. This has now been rectified.

Since the last issue the FBAS have been to the "Grow" garden show at Sandown Park. It was a most enjoyable - but tiring - weekend. It is always nice to have the opportunity of speaking to existing and prospective pond/fish keepers at such events. This is also one of the ways that we can keep the hobby alive. As can be seen from this quarter's cover, the pond display was again a resounding success and an example of good practice to all. Because we are in the 'pond season', this issue is a little biased towards ponds, lighting, pond life, etc., but don't despair all you non-pond aquarists - there's still plenty for you, too!

For any of you who were still wondering: Yes, the "Wanted" in the Spring issue was our very own aquatic elder statesman, Jack Stillwell. Unfortunately there was not enough space to include a "Wanted" in this issue, but it will return in the next issue.

In this, the 60th Anniversary year of the FBAS, you will be able to subscribe to "Fishworld" via a series of special offer packages at "Fishworld '98", Hampton Court Flower Show and Weston-Super-Mare. These packages will include some rather 'lusty' free gifts. Watch for details!

Mary Bailey of Cichlid Press (UK) informs me that David Sands' "Back to Nature Guide to Catfishes" reviewed in the Spring '98 issue of "Fishworld" has a retail price of £12.95 not £10.00 as was quoted. We acquired our copy direct from the author, who was obviously selling at discount prices!

Sue Crew, Editor

Contributions for the next issue should be posted to me by 30th July, 1998 at the address in the FBAS Year Book (1998) or Sue Crew c/o Epoch - address below
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COVER PHOTO by Peter Furze

The completed FBAS pond exhibit which was built and displayed at "Grow 98".

PLANNING A HOLIDAY THIS SUMMER?

by Dr. Peter Burgess of the Aquarian Advisory Service

Will your aquarium fish survive during your absence? Here are ten tips for all you jet-setting aquarists:

1. Your fish should come to no harm if left without food for up to a week, provided they are healthy.
2. If you plan to be away for longer than a week, arrange for someone to feed your fish, or purchase an automatic feeder (available from your aquarium supplier).
3. If the nominated 'fish minder' is not an experienced aquarist, then s/he is likely to overfeed them, with potentially disastrous consequences to the water quality. You can avoid this problem by measuring out each food ration into a small air-tight container, such as a 35mm film canister or small zip-seal plastic bag. For example, if the minder is happy to pop in once a day, then provide one container for each day of the week and label it accordingly (e.g. Monday, Tuesday, etc.). If you own several aquaria, prepare one set of containers for each tank. It is a good idea to leave a set of emergency instructions, ideally with the telephone number of an experienced aquarist or aquarium retailer who would be willing to sort out any problems (but do ask them first!).
4. Fish fry generally require frequent feeds and may die if left unattended for more than a couple of days. If you regularly breed fish (especially egg-layers) try and avoid

hatchling or rearing fry just before your holiday.

5. Do not purchase new fish for at least two weeks before going away. Most aquarists do not quarantine new stock and the last thing you want is a disease outbreak just as you are about to set off on your trip!
6. Timer-controlled lights can be left to operate normally during your absence. Manually operated lights should be switched off, rather than permanently left on.
7. Do not switch off heaters, pumps or filters whilst you are away (it is amazing how many aquarists do this).
8. If you have a canister filter, check whether the filter medium requires cleaning. A clogged filter will be inefficient and this could lead to a water quality problem while you are away. A partial water change (say 20%) and a quick siphon over the gravel may also be worthwhile.
9. Two or three days before you depart, check that all the fish appear healthy and that the life-support equipment is working properly. Don't leave these checks until the last minute, otherwise you may not have time to take remedial action should you discover a problem.
10. Resist the temptation to add extra food to the tank just before you go away. Excess uneaten food may foul the water. Remember, it is poor water quality rather than starvation which kill most aquarium fish.

Last, but not least, relax and have a marvellous holiday. Bon voyage!



BRITISH AMPHIBIANS by Sue Crew

Common Frog (*Rana temporaria*)

The Common Frog exhibits a dark patch enclosing the eye and dorsum, smooth, moist skin and moves in springing leaps. Common Frogs are also known as European Grass Frogs, which is a more accurate and descriptive name for them as they are now not so commonly found and are mottled shades of green, yellow or brown. Females of the species grow to 75mm (3") in length - the males being smaller. Frogs can croak in 2 pitches. One pitch repels others (particularly over-ambitious males), and the other attracts females.

Common Frogs spend much of their life on land, but during their fifth Spring between January and March they gather in shallow ponds to spawn. The length of the photoperiod (daylight) together with the raised temperature in spring, prompts the male into breeding. The females actually arrive later than the males at the watery breeding site. Males outnumber females approximately 3:1 or 4:1. It is usually the younger or weaker males that are left out of the breeding ritual. Males have to fight to win a female and many male frogs die from exhaustion - either from the battle itself or from lack of resources in escaping predators as a result of their exhaustion. During the spawning season the male of the species grow horny nuptial pads on the thumbs of their front feet to help grip the female's slippery skin and stimulate her to spawn. The female develops pearly granules on her flanks.

To spawn, the male positions himself on the female's back and grasps her round the chest with his front legs just behind her forearms (amplexus). They swim in this position for several days (or even weeks)

until the female suddenly lays between 1000 and 3000 eggs and the male simultaneously fertilises them with milt (sperm) as they are released from the female's vent. The eggs are all laid in one batch - usually early in the morning - in either temporary or permanent bodies of water. The eggs measure 2-3mm (0.1") when laid. The jelly surrounding the eggs swells in water and the eggs float, often in great mats when spawn from dozens of other mating couples collect together. When spawning is complete, the parents separate, but the males remain at the breeding site to mate with another female. No further interest in the eggs is shown by either parent.

A frog's spawning embrace can be fatal to fish - the grip is strong and in its desperation to breed it will sometimes short-sightedly grab at the nearest article. However, the risk of this is slight.

The gold speckled brown tadpoles hatch after 4 - 5 days, but stay within the jelly mass for 1 - 2 days more until the yolk sac is absorbed. They remain swimming in swirling masses around the spawning clumps, feeding on algae, debris, uneaten fish food and dead animal matter. Tadpoles are scavengers and in this way will spring-clean your pond for you. As they grow they become more secretive and hide in the pond weed from preying fish, newts and insects (particularly the Diving Beetle).

Newly hatched tadpoles possess external frond-like gills, but these are absorbed after approximately 4 weeks. Their hind legs appear at 7 weeks when the tadpoles measure approximately 10mm (0.45"), but the front legs remain below the skin until the twelfth week when the tail is absorbed and the lungs are functional. The tadpoles also derive nourishment from the absorption of the tail.

Common Toad (*Bufo bufo*)

Generally, toads differ from frogs in that they have a drier, warty skin and a large gland behind the eye. They also have shorter legs on which they crawl - unlike frogs who hop.

Toads are a mottled green or brown on their backs with a light coloured belly, but without the Common Frog's eye patch. Females outgrow males to reach 100mm (4") long. During the day, toads usually remain concealed in a hole or a shady spot amongst plants, but in the late evening or early night, they move out to hunt for food. Toads are not found in Ireland.

In March and early April, the males of the species often gather in groups of thousands to spawn. Spawning takes place in a week or so under water with the males gripping the females in the same style adopted by frogs.

A double row of black eggs lie in a continuous string of clear jelly up to 3m (10') long. The string is intertwined around the stems and leaves of aquatic plants. Females lay 1000 to 4000 eggs, but only approximately 5% of these survive to adulthood.

The tadpoles hatch after 2 or 3 weeks and are black with a rounded tail tip. They swim freely in open water, sometimes in shoals of tens of thousands, which is quite unlike frog tadpoles who are secretive.

Toad tadpoles are omnivorous, feeding on algae, rotting plants and animal corpses. Toad tadpole skin is obnoxious to fish, but is relished by insects such as Diving Beetles, Water Boatmen, Dragon Flies and also Great Crested Newts.

On damp nights in June or July tiny toads can be seen leaving the water in droves for their new terrestrial homes. They will not return to water except for a quick soak

during a very dry spell of weather or until they are ready to breed in 2 or 3 years time.

Natterjack Toad (*Bufo calamita*)

Natterjack Toads reach 80mm (3.2") and are brown, grey or greenish in colour. They can also be found in brackish pools if close to the sea.

The prominent yellow stripe down its back distinguishes the Natterjack Toad easily. It is much rarer than the Common Toad, faster moving and usually inhabits a sandy environment where it spends most of the day in its burrow.

Breeding male Natterjacks keep up a noisy and protracted croaking during nights in May and their eggs are laid in a single string of spawn.

The young Natterjack Toads leave the water fully formed after only 6 weeks or so.

Common or Smooth Newt (*Triturus vulgaris*)

The Smooth Newt is the most commonly found of the three native species. Distribution is fairly consistent throughout Britain, except in mountainous areas or heathlands. They live on land, hiding during the day and emerging at night to feed. In winter they hibernate under stones and in crevices.

They are more usually seen between February and June when they move to water to breed. During this time the male displays his bright breeding colours and a crest of skin which starts at the back of the head and develops into a tall, undulating crest. The crest attains its greatest height behind the root of the tail. There is also a similar crest along the lower edge of the tail. During the breeding season the males develop narrow fringes of skin on the toes of the back feet. At this time the 'teeth' of the crest are black. For most of the year



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the skin is olive-brown. The female's throat is white with black spots. In the breeding season the male has black spots, orange-yellow belly, enlarged dorsal crest and striped head. Smooth Newts grow to 100mm (4") long including the tail.

To enable breeding, newts will occupy any small body of water including garden ponds, providing it has a good growth of aquatic plants.

The spring courtship and breeding behaviour of the Common Newt is an elaborate tail-waving dance around the female on the bed of the pond. The male then sheds a sperm capsule, which the female takes into her body, so that the eggs can be fertilised internally. The female then wraps each newly laid egg individually in a plant leaf and secretes a fluid that seals it up.

The tadpoles hatch after about a week and are entirely carnivorous, feeding on tiny animals such as Daphnia. The tadpoles have 3 external gills which remain until metamorphosis is almost complete. Unlike frog tadpoles, they develop the front legs earlier than the rear legs. They stay hidden in pond weed to avoid predators.

The young newts leave the water in August or September, but some overwinter in tadpole form in deep ponds.

Crested Newt (*Triturus cristatus*)

The Crested or Great Crested Newt is the largest of the three native species in Britain at 6.25" (160mm). The skin has numerous mucus glands and is very warty, particularly along the sides. The back and sides of the newt are dark brown/black, the sides have white spots, the underside orange with a few large black spots. In spring the males grow a high, toothed crest along the back and extends along the back to the tip of the tail. There is also a skin fold on the underside of the tail.

The female does not show a dorsal crest, but a slight dorsal ridge and a crest on the tail. The underside of the female is usually darker with smaller, less obvious spots. When the eggs have been laid, the male loses his dorsal crest. The skin seems to shrink leaving a more warty surface.

Crested Newts tend to live in lowland country, often in woodland. During the breeding season it prefers very deep lakes and ponds with dense vegetation.

Egg-laying usually begins in April or May and continues for a long time, during which she lays some 200 - 300 eggs.

When disturbed Crested Newts tend to produce a very pungent smell. They feed on worms, snails and larvae.

Palmarie Newt (*Triturus helveticus*)

The female is the larger of the species and grows to 4" (100mm). This newt has almost smooth skin although it has very fine granulations. In the breeding season the male has a small filament (5mm) at the end of the tail, a fairly low dorsal crest and well-developed webs on the back feet.

The back of the male is olive green/brown and on each side of the head there is a dark stripe which starts on the nose and runs through the eye. In both sexes the belly is pale orange/yellow. When the newt is on land it usually shows a narrow yellow or reddish stripe along the middle of the back.

The Palmarie Newt can be found in shallow or deep ponds and lakes, slow-flowing streams, and even in brackish water where its chosen home is near the sea.

Over a period of 3 - 4 weeks the female lays 300 - 400 eggs.

Palmarie Newts feed mainly on small worms, insects and larvae.

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General Information on Newts

If you take newts home to your pond you will have difficulty in keeping them there as they will migrate back to their original home.

The breeding habits of all three types of newt are strikingly similar. To initiate breeding activity the male will walk backwards and forwards in front of his chosen mate vibrating his tail. When he finds a receptive female he will deposit a packet of sperm (spermatophore) on the pond floor. The female walks over the packet and absorbs it into her vent (cloaca) and internally fertilises the eggs. She then lays her eggs singly in the leaves of aquatic plants. After laying each egg she folds it in the leaf of the plant to protect it from predators.

The eggs will hatch in 7-21 days. The tadpoles are born with 3 external gills. They are secretive and hide amongst the pond plants. They grow their front legs first (unlike frogs and toads who develop their rear legs first). In late summer they will have all 4 limbs and will leave the water to hibernate on land - usually under stones - until the next spring. Some newts will not metamorphose until the following spring and will hibernate in the water. Very few newts who have metamorphosed will hibernate under water.

Newts usually shed their skin approximately once each week in spring. Sometimes the newt will eat its sloughed skin. Normally newts do not utter sounds, but if they are gripped round the body they may produce a weak sound, although they do not have vocal chords.

When extremely hungry newts may attack members of their own species and bite pieces out of the tail.

Newts have numerous enemies - apart from humans - including water-beetles, leeches, fish, grass snakes and other snakes, stoaks and other fish-eating birds.

THE FISH IMPORTATION DEBATE - are we to lose part of the richness of our hobby?

by Dr. Peter Burgess
Fish Health Scientist and
Conservationist
(Peter is a Consultant to the
Aquarian Advisory Service)

As many of you may know, the Government has plans to impose import restrictions for certain ornamental freshwater fish - notably coldwater species.

Before outlining the reasons for such proposals and the fish species which may be affected, it is important to stress that the Government are not contemplating an outright ban on coldwater fish imports, however, they will be requiring health certification to accompany some species, and a licence to keep others.

Let me try and address some of the most commonly asked questions:

1. Who is proposing to implement these restrictions?

Basically, our Government (in line with other EEC countries) via the Ministry of Agriculture, Fisheries and Food (MAFF) through the MAFF Centre for the Environment, Fisheries and Aquaculture Science (CEFAS).

2. Why are restrictions considered necessary?

A major concern is the risk that exotic fish might become established (accidentally or otherwise) in our waters and upset the local ecology. Clearly, exotic coldwater fish are more likely to survive in UK waters than would a Cichlid or Tetra. Even if they did not breed, they could still survive long enough to transmit some deadly disease to our native species. We also have to bear in mind that many exotic coldwater

fish are cyprinids (e.g. Carpe, North American Minnows, Bitterlings, etc.) just as are many of our native fish - and hence numerous pathogens and parasites may easily 'jump' from an exotic cyprinid to a UK native cyprinid. The accidental introduction of a 'new' disease could cause havoc to our food fish and coarse fish industries.

EDITOR'S NOTE: It is unlawful under the Wildlife and Countryside Act 1981 to release or allow to escape into the wild, any non-native species and the Salmon and Freshwater Fisheries Act 1975 requires that consent is obtained from the Environment Agency to introduce any fish into inland water.

3. Which species are proposed to be included?

Two categories exist:

a. Species for which you will need a licence to keep.

This is a relatively small list of species (referred to by MAFF as the 'provisional list'), and most of those included are not of major importance to aquarists and pondkeepers. Goldfish and Koi are NOT listed and hence no licence is required (what a relief!). Those of ornamental and related interest include:

- Grass Carp
- Clicker Barb
- Rock Bass
- Bitterling
- Pumpkinseed
- Sturgeons
- Wels Catfish
- Bullhead Catfish

Goodness knows how this list was arrived at!

b. Species which will require health certification from the country of export.

This relates to imports from "third countries" i.e. those outside the EEC.

Clearly, the risk of disease introduction is the reason for this certification, so again, it primarily relates to coldwater fish, not tropicals. However, it would seem that MAFF do not as yet have a clear definition of what is or is not a 'tropical fish' and this poses a grey area in the case of 'borderline' species, such as Gambusia mosquitofish, which can span a wide temperature range. The UK requirement for a health certificate could have a serious impact on the coldwater hobby, especially for those aquarists (like me) who enjoy keeping the more unusual species, notably North American and Chinese fish. Goldfish and Koi enthusiasts need not be too concerned since the regulations could not have any significant effects on the imports of these popular species.

4. How will the health restrictions be imposed?

As mentioned before, this is not an outright ban, but in fact the consequences could be almost as bad. Fundamentally, a fish exporter intending to send certain coldwater species to the UK will have to provide documentary evidence that the fish have not come from a farm (or other source) which has a history of disease (MAFF have listed the fish diseases of concern). The exporter must have the necessary health records to accompany the export. The problem is that some (many?) exporters have not bothered to undertake the necessary health monitoring and so will not legally be able to export such fish.

5. How will these proposed changes affect the hobbyist?

In their circular of 9th July, MAFF state that ANYONE who wishes to keep any non-native fish species mentioned on the provisional list (see 3a, above) will have to

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Federation of British Aquatic Societies



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obtain a licence. A fee of £30 is proposed for the licence. So, if for example, you plan to keep a pair of Bitterling in your pond, then you will need to buy a licence. I am not clear as to whether this extends to keeping such fish in an aquarium. I doubt very much whether MAFF or anyone else will bother to police this legislation, so the whole concept seems rather pointless to me (after all, paying a licence fee is not likely to reduce the chances of an exotic fish being introduced into our waters, is it?).

Hobbyists who enjoy keeping North American and coldwater Asiatic fish may find them becoming exceedingly scarce within the hobby. So, beware!

6. What can we do?

First, we must sympathise with the reasons for such restrictions, namely to protect our native fishes and aquatic habitats, and our commercial fish industries. I am sure we would all agree with the importance of such conservation measures. However, what we must not allow is for species to be included on the list which need not be there. For example, I do not honestly think that Hong Kong Suckerfish (*Gastromyzon* and related genera) are ever likely to find their way into our waters, yet they were listed by MAFF. Who in their right mind would wish to dump a 3" Suckerfish, probably costing £5 and upwards, into the nearest river? If it could then survive, establish and breed in our waters then I am sure someone would have discovered this by now and made a small fortune in selling pond-bred Suckerfish! So, we must air our views and concerns to MAFF, in order that we end up with a SENSIBLE list and not some token political gesture of a list.

This is where the Federation of British Aquatic Societies and myself are joining forces*. We have teamed up to represent you, the hobbyist, at future round-table

MAFF meetings concerning ornamental fish imports. We will also be acting as the voice of the hobby in written and other communications to MAFF and other bodies.

Secondly, as a precaution, I urge everyone who is keeping the more unusual coldwater species to try to breed them in captivity and spread the progeny among other enthusiasts. If we cannot import certain coldwater species, then we must either produce our own or lose them from the hobby. The choice is yours and time is running out.

MY PERSONAL VIEWS

I believe it would be a great tragedy if we lost many of the unusual coldwater species currently available to our hobby. A growing number of aquarists have discovered the fascination of 'unusual' coldwater fish such as American Minnows, Sunfish, and Darters as well as the weird and wonderful Loaches and Cyprinids coming from China. Let us try and preserve this richness for all to enjoy.

I must end by stating that this article reflects my personal views only. I should add that the Government proposals on fish imports is a minefield of regulations. I have endeavoured to extract correct and up-to-date information for this article, but minor details may be subsequently changed. We will inform you of future developments. In the meantime get breeding those coldwater fish!

* Dr. Burgess and Roger Crew have been appointed by the Federation of British Aquatic Societies to represent the organisation in consultations with the Ministry of Agriculture, Fisheries and Food.

A NEW NOTHOBRANCHIUS
Nothobranchius fuscotaeniatus
by Richard Cox

(Reprinted with the kind permission of the BKA from "Killifish News" - Journal of the British Killifish Association No. 390, March 1998)

First Description:

Seegers, L., 1997. Description of *Nothobranchius fuscotaeniatus*, new species. *Aqualog: Killifishes of the World, Old World Killifish II*. Morfelden Waldorf: Verlag A.C.S. GmbH, Germany: 12

Meaning of Name:

Derived from the Latin *Fuscus*, dark and *taeniatus* and refers to the dark stripes on the body of both male and female.

The species was collected by Lothar Seegers on 22nd July, 1997, from the lower Rufiji river drainage system about 2km south of Ndundu ferry across the Rufiji river on the road from Nyanwage to Kibiti.

Terra Typica:

The species was collected at a site designated TZ97/57. This is a roadside ditch about 2m wide and 10m long with an average depth of about 60cms. It was partly covered by grass, especially near the margins but with some areas of open water. Most probably the species may occur in mainly seasonal habitats within the lower Rufiji river drainage system. This, however, is an assumption based on the distribution pattern seen with other *Nothobranchius* species which were found syntopic, viz. *N. lourensi* Wildekamp, 1977 and *N. Janpapi* Wildekamp, 1977. No other fishes were present and all those caught were in good condition. Whilst no water measurements were taken, usually in this type of habitat the water is very soft with very little dissolved salts and a pH of about 7 to 7.2.

Meristics:

D = 15-16; A = 17

Seen from the sides of the body is relatively deep and rhombic with the deepest part being between the dorsal and anal fins.

Holotype:

ZMB 32.781, male, 33.1mm from snout to caudal origin (= standard length: SL) and 42.1mm from snout to end of caudal fin (= total length: TL). Tanzania: Coastal Region, lower Rufiji river drainage, about 2km south of Ndundu ferry across the Rufiji river along the road from Nyanwage to Kibiti, collected by L. Seegers on 22nd July, 1997.

Paratypes:

ZMB 32.782, 3 males, 25.1 to 31.3mm SL and 30.1 to 39.3mm TL and ZMB 32.783, 6 females, 25.1 to 28.1mm SL and 31.1 to 35.0mm TL. Collected with holotype.

Size:

Males can reach a length of about 45mm, females somewhat less at about 40mm.

Code: FUS

Description is unique in that it displays an intense deep blue green colouration with no red either in the body or fins. The females also display the same colouration although somewhat subdued. No other *Nothobranchius* species is known in which the females show distinct bars across the body.

In the male the ground colour is of a bluish-green, slightly lighter towards the belly. The back and upper head are brown. The body has about 9 to 10 bars, which are reddish brown and run into the dorsal and proximal half of the anal fin. Both fins are edged in white and have black submarginal bands in their rear parts which are not sharply defined. The caudal fin is black for about a third followed by a reddish band of about the same width followed by a yellow or greenish band. This again is followed by a narrow blue-green and brown band.

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The caudal peduncle is green with some dark markings. All in all a very striking fish.

Breeding and maintenance:

This species can be kept in normal tap water with a pH of about 7 to 8 and a total hardness of around the 11°GDH. They should ideally be kept at a temperature of between 22° and 24°C during the day and allowed to drop to around 19°C at night. They spawn in peat moss, the eggs being about 1.5mm in diameter and coloured slightly brownish so are easily spotted. The eggs are stored in the usual way, away from the light at a temperature of about 22° to 24°C for between 10 to 12 weeks. Good hatches are possible if stored at a temperature of between 20° and 26°C (65° to 80°F).

When eyed up the eggs should be covered in water, either fresh or aged, to a depth of about 7 to 8cm. The water should be rather chilly at about 16° to 18°C. The addition of salt at the rate of 1 teaspoonful per litre of water will help to fight velvet and increase the longevity of newly hatched brine shrimps which are fed but first micro worms should be given as the fry are very small. Hatching usually occurs after 1 to 12 hours of wetting. Once feeding, the fry present no further problems and grow quickly and start sexing out after 2 to 2.5 months.

N. fuscotaeniatus can also be raised in water with a pH of 6.8 to 7 and even up to 8. Hardness of 9 to 10 and temperature ranging between 23° to 25°C. Such water can usually be obtained by mixing tap and rain water. Whilst some use salt it has been found that gentle aeration is a good method of controlling velvet.

A box for the spawning substrate is recommended so as to separate it from waste material in the tank.

Due to its high metabolic rate *N. fuscotaeniatus* must be provided with a varied and concentrated diet otherwise the fish will soon deteriorate.

Literature:

Seegers, L. 1997 - Description of *N. fuscotaeniatus* new species - Aqualog; Killifishes of the World, Old World Killifish II, Morfelden-Waldorf.

(Compiled from material contained in web site [HTTP://www.ping.be/~pin10516](http://www.ping.be/~pin10516). It should be noted that this fish was first collected by Watters & Wildekamp and designated *N. sp Kitonga North TAN 979*).



THE BRITISH KILLIFISH ASSOCIATION

The British Killifish Association is dedicated to the study of, propagation of, and publication of knowledge pertaining to Killifish. It is one of the most successful specialist societies with members all over the world and publishes a monthly magazine - "Killifish News" - which includes a colour photograph of a Killifish with each issue.

The BKA has its own web page which can be accessed via the British Aquatic Resource Centre site and the address is <http://www.elke.demon.co.uk>.

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To join the BKA please send your details and payment for subscription to the Registrar, Mr. Cliff Griffiths, 8 Crophorne Close, Woodrow North, Redditch, Worcs. B98 7SJ Tel: 01527 523625

If you would like to receive a complimentary copy of "Killifish News" contact the Publicity Officer, Mr. Adrian Burge, 14 Hubbard Close, Wymondham, Norfolk, NR18 0DU. Tel: 01953 607004

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WALTHAM's experts are often asked for advice on feeding and care of fish. We include a selection of your questions here.

Dear Dr. Ford,

I have been keeping tropical fish for the past four years in

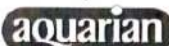
a very modest way and am pleased to say have a pair of Angel Fish, three Black Widows and an aqua frog - all of which I bought when I first began.

My problem now is, that about nine months ago I bought a tropical plant for the tank and found that the plant had snails. Very quickly they were everywhere (even in the filter and heater). I have repeatedly stripped the tank, washed everything, thrown the plant away and replaced the stones. The snails keep reappearing, however.

Is there a product on the market that I can buy to keep the tank clear of these creatures? I feel that I am fighting a losing battle.

Snails are actually harmful to fish because they carry parasites, so it is wise to remove them from the aquarium.

Do not crush the shells to allow the fish to eat them - that is how gut parasites get into the fish. Actually remove the snails using the bait technique detailed in Aquarium Advisory Service Bulletin No. 16 (reproduced below). Remember to do this in the dark, as when the lights are on the snails go into the gravel ... for every eye you see there are 100 hiding!



THE AQUARIAN ADVISORY SERVICE BULLETIN NO. 16

CONTROL OF SNAILS IN FRESHWATER AQUARIA

The snails may be baited in the following way:- An inverted saucer is placed over a piece of meat and raised slightly off the bottom of the tank - just enough to allow the snails to crawl in but not enough to allow the fish to swim in and eat the bait. This is left overnight and the snails removed the following morning. The procedure is repeated with fresh bait until the snail population is down to a controllable level.

Could you please send me all the information you have on Cichlids? I would really appreciate this.

The most popular of all Cichlids is the Discus. The secret of success is water quality. Although some aquarists claim Discus can live in local tapwater, you cannot expect them to breed, or the eggs to be viable, in water that is not identical to their Amazonian home.

Therefore you need to collect rainwater or use a reverse osmosis unit, and store the water over peat to make it acid.

The other popular Cichlids are the New

World ones, especially the Dwarf varieties. They are often non-aggressive and easy to keep. They need neutral or soft water.

The most demanding are the Old World Cichlids, especially the Rift Valley ones. They are aggressive and require special waters (300 ppm CA⁺⁺ or more).

I cannot describe the many hundreds of species available in a letter ... it would require a book to be written. See for example "The Cichlid Aquarium" by Dr. P.V. Loiselle, Tetra-Press, ISBN 3-923889-20-0 (1985). "A Complete Introduction to Cichlids" by Dr. E.J. Goldstein, TFH Library CO-011, ISBN 0-8662-260-X. "A Fishkeeper's Guide to Central American Cichlids" by David Sands, Salamander Books, ISBN 0-86301-208-9 (1986).

There are no magazines devoted exclusively to Cichlids, except the Club Monthly published by the British Cichlid Association. For details contact: The Editor, B.C.A., 7 Allan Walk, Newton Aycliffe, Co. Durham, DL5 5RN

I currently have a 48" x 15" x 12" tank housing tropical fish. I have noticed with interest the tank on bricks in Holburn Studios. I would like to know how to build a tank of this kind.

My current tank is filtered with an external Fluval 4, which I find is a good filter for tank stability, but is useless for removing solid matter (that floats round the tank) and for moving the water around the tank as I find the return really weak. I therefore use an internal Fluval 4 as well. I do not use an air pump because the two filters move the water and circulate it enough.

The main fish I have in the tank are Angels,

but I also have Corydoras, Neons, Guppies, a Sailfin Plecostomus and two Thoracatoma Catfish.

I would like to build a tank setup similar to that in the Holburn Studios on the floor - perhaps as a room divider. I feel that this would give it a more 'permanent' position in my home.

Bricks are ideal as a base - just build a wall, as long as the base is solid (over beams rather than 'bouncy' floorboards). You can use breeze blocks for a quick wall, too. Place a sheet of blockboard on the top and rest the aquarium thereon, with polystyrene tiles if needed. The following is my standard reply about tank as well as stand building:

Standard aquaria are mass-produced and so each individual tank is quite cheap to buy. If you want a non-standard size, it has to be individually made and that can triple the price. The best bet is to build one yourself.

The recommended thickness for large tanks is 15mm, but, because of the weight problem, many manufacturers only use 10mm, relying on cross straps for strength. Another factor is the age of the glass. New 10mm can be stronger than old 15mm, because glass rapidly becomes more crystalline and hence more brittle.

Buy the glass ready cut to size with the edges rough ground for safety in handling. Assemble with a light smear of transparent Silicone Sealer and hold with sticky tape for a day. Make sure the edges are clean and free of grease by wiping with Methylated Spirit.

Then make water-tight by running Silicone Sealer along all internal joints, smoothing with a wet thumb. A blob of Silicone Sealer on cross straps is sufficient, including a



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number for the drip tray or cover glass. Leave for another day.

Marine ply suitably waterproofed with polyurethane varnish makes an excellent box, to which a 10mm or 12mm window can be silicone sealed into place internally.

Stands must be adequate, of course. If a cabinet or other furniture is to be used, can a large man (equals a 3 foot tank) or two (equals a 6 foot tank) stand on the cabinet? A metal stand (angle iron) is best, but make sure the floor can take the pressure of the small foot area. Floorboards (especially in mature houses where central heating has shrunk the wood) can have 'bouncy' floors (use a cross piece to fix the stand to the wall).

Height is important - manufacturers make low stands for safety (a tank is top heavy) but most hobbyists prefer to view the fish standing up, so a 30" even 36" stand is preferred to a 24" high one, but these can be pulled over because of the high centre of gravity ... another reason for fixing to a wall.

For more ideas, see "Making Your Own Aquarium" by Jorgen Hansen, Bell & Hyman, ISBN 0-7135-1929-0 (1979) available from Bell & Hyman Ltd., Denmark House, 37/39, Queen Elizabeth Street, London, SE1 2QB

If you make your own top you can fix fluorescent lights anywhere - but to make life easier, hang the starter/choke on a picture hook behind the tank. If you use spotlights, hang them from the ceiling or wall angle mounts about 12" above the water and have a pelmet instead of a hood, with a glass top cover.

You can send your question to us at the address below. We are sorry that we are not able to reply to the questions individually, but the most frequently asked and the most interesting ones will be answered on these pages.

When you write to us, make sure you tell us which part of the country or world you live in, because the advice may need to be different:

Waltham Centre for Pet Nutrition,
 PO Box 44,
 Leicestershire,
 LE14 4ZT

In the UK write to:

Aquarian Advisory Service,
 Waltham Aquacentre,
 PO Box 5059,
 Melton Mowbray,
 LE14 4ZN

or EMAIL:

aquarian@compuserve.com

JACK THE LAD by Jack Stillwell 1955 National Exhibition of Aquaria, Olympia

Whatever happened to the 'Talking Fish'? No, I don't mean the Talking Catfish, but the one made by the Li-Lo company for the Federation of British Aquatic Societies. It was designed by our members for use at the 1955 National Exhibition of Aquaria, held at Olympia. It was part of the Federation's display, which also included one, advertising the Federation's services and its newly-approved guides for the genus *Barbus*. This was a new departure for the Federation in those days.

The idea of the 'Talking Fish' was for members of the general public to ask questions of the fish, which would then provide the answers. I well remember we had a lot of fun

at the expense of whoever was behind the fish by asking some very awkward and sometimes very personal questions! Nothing changes! This innovation was, however, a very big success and there was usually a long line of people waiting to ask the 'Talking Fish' a question or two.

That same year, the Goldfish Society put on a display of fish to emphasise the desirability of their four basic varieties: Singletails, Twintails, Globe Eyes and Bramble Heads. What made this display particularly memorable for me was that it was in a twelve foot tank - the biggest I had ever seen outside of the London Zoo!



The Federation of Guppy Breeders Societies, which had a very active section in Portsmouth, staged an exhibition of eleven types of male and five types of female Guppies featured in their standards. We still use the same standards today.

Represented in the aquaria section were the following societies: Amersham, Fulham, Catford, Chelmsford, Chelsea, E.L.P.A. Enterprise, Felham, G.S.G.B., Hampstead, Hendon, Hornsey, Hull, Kingston, Lambeth, London Transport, Marble Arch, North Hants, North London, Portsmouth, Southall, Southampton, Spelthorpe, Stoke Newington, Surrey, Thameside, The 57 Club, The Twenty Club, Walthamstow, Wembley and Willesden. Alas, like the

'Talking Fish', all but a few have disappeared!

The Judges too are sorely depleted from those days: Len Betts, Arthur Boarder, Frazer Branmer, Cecil Creed, Bob

Holland, Willy Howe, J. Little, W. Mandeville, Bob Mealand, C.J. Saunders. They are all gone.

I know this might all just be history to you, but it shows what the hobby was and again could be. Writing about all this also makes me feel quite ancient!

Jack.

REPOTTING WATER LILLIES

Water Lilies (*Nymphaea*) are a joy to see in a pond when they are in flower in summer, but after two or three years they become overcrowded and need repotting in the same way that your household plants do. Overcrowding will become apparent if your Water Lily suddenly stops blooming, this may well be because there are so many leaves that the buds cannot open properly because there is too little space available amongst the leaves.

If you are going to divide your Water Lily, the best time to do it is when the new growth has started and there is a full growing season ahead so that the plants can become firmly re-established again.

Although there are a variety of shapes of rhizomes (bulbs or tubers) all can be cut apart and replanted to reproduce the plant. Water Lilies are quite expensive to buy and this is a good method for propagation within your own pond. Alternatively, you can sell the additional plants at your fish club or pass them onto friends.

The ideal planting density for most varieties is one plant to approximately 2.3 sq. m. (25 sq. ft.) of water.

Your first task will be to ease the plant from its container. This may not be as easy as it sounds as the roots will probably have grown through the container. Remove the compost from the root ball and remove most of the foliage so that you are able to see where you are cutting. The best and most vigorous pieces will be end pieces, so these

should be the ones that you keep yourself! The older central parts of the plant will take a little longer to grow on and flower. At this point you should trim away the old roots from the rhizome, but ensure that you do not damage the new roots.

To re-pot your Lilies you should use a heavy, loam based compost - do not use a peat based compost or one which contains terrestrial fertilisers as these usually contain nitrates and will upset the water quality in your pond. Always use one of the special aquatic planting baskets to plant your Lilies in as these allow water to enter and escape the container all round and will not produce

any stagnant areas, which may cause the plant to rot.

When the Lily is planted cover the top of the compost with a layer of gravel - preferably pea gravel which has rounded edges and will not cause damage to your fish.

Soak the container thoroughly and lower it into shallow water or raise

the pot on an upturned flower pot (or similar) until the Lily pads comfortably lay on the surface of the water. When the stems lengthen you can increase the depth at which the container rests. If you plant your Lily too deep, the plant may rot away and will probably not flower.

There are a wide variety of Water Lilies available in many different colours, flower formations and sizes. Ensure that you carefully read the planting information (which should be available with every plant) prior to purchasing it so that you take home with you a plant which you will be able to enjoy for many years.

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ABERDARE have already held their show (5th April, 1998) and their winners are as follows:

- B.y - M.y (Tropical Egglayers)**
1st Robert O'Grady (Swansea)
2nd Gemma Cox (Merthyr)
3rd Robert O'Grady (Swansea)
4th D & D Johns (Aberdare)

- O.y - T.y (Tropical Livebearers)**
1st Robert O'Grady (Swansea)
2nd Gemma Cox (Merthyr)
3rd R & S Williams (Aberdare)
4th Robert O'Grady (Swansea)

Welcome to the NJFA section of "FISHWORLD". It's been a hectic last few months, with all sorts of things happening. By the time you read this, of course, it will be some three months on, however, I somehow doubt that our Postman will forget as when it comes round to Christmas time. He's been carrying all your responses to "FISHING FOR WORDS" II and III, together with your entries into the TETRA/NJFA Colouring Competition. By the time you read this we will have drawn the winners for both of the Word Searches and some of the pictures you have sent in will already have been displayed at "Fishworld '98" in Dunstable at the end of May. Keep your entries coming in to the different competitions - all winners will be listed here in your JUNIOR SECTION.

Robert O'Grady was the owner of the Best Fish in Junior Classes. Particular thanks go to Colin Harding and Clive Davies for judging the Junior Classes.

STROOD held their show on Sunday, 26th April, 1998 with the following results:

- B.y - M.y (Tropical Egglayers)**
1st Joseph Toomer (Erith)

- O.y - T.y (Tropical Livebearers)**
1st Aaron Toomer (Erith)

Joseph Toomer's O. laipes was judged to be the Best Fish in Junior Classes, and particular thanks go to Chris Cheswright for judging the Junior Classes.

We would also like to hear from more of you about your fishkeeping, your club or society activities, or anything else remotely 'fishy'!

These clubs were encouraged and supported by the NJFA with prizes of tubs of fish food kindly donated to us by ROLF C. HAGEN. They will also, by now, have received in the post Diplomas and Certificates from the NJFA marking their success. If there are a sufficient number of "Best Fish" in junior sections at shows, there is a possibility that we will be able to invite these to a Championship at the Federation of British Aquatic Society's fishkeeping extravaganza weekend at Weston-Super-Mare in the Autumn. So, keep plugging away at those Show Secretaries! By the next issue of

SHOW RESULTS

The Open Show season is well on its way and I can let you know that some clubs, societies and groups have already been in touch with us about running Junior Classes at their shows.

It has to be said that although very few examples of this fish were imported into Europe - probably around 1907 - they were scooped up by the serious aquarist and then it was down to genetics and patience. Out of which, in not too many years, came heightened colour and pattern varieties. To the advantage of this work, it was found that the Platy would hybridise easily with the Swordtail. The Sword seemed to enhance the colour patterns of the Platy. Some of these hybrids were fertile, from which breeders were able to perfect, fix and intensify the particular colour and/or pattern mix which they preferred. It was not all one way traffic either, as many of today's varieties of Swordtails come from a Platy cross.

Probably the foremost work on this was carried out in Germany where original wild specimens of Platy and



Montezuma Swordtail

Sword were crossed, providing hybrids which were again crossed either with each other or back to the wild Platy or Sword, and so it went on. An example of this was the so-called 'half-moon', where a crescent pattern of spots were noted in some stock individuals of the German breeder George Gerlach. In fact, this became the fish's common name for a while, prior to the American shortening of Platypoecilus.

It is said that, in the wild, if you waited actually spot a Platy, you would never catch any. This is because they live in massed clumps of submerged plants, the tangled mess of roots of floating plants and the overhanging areas of river banks. In these

secret areas, they are out of sight and reach of such feathered predators as Herons and Kingfishers. Similarly, out of ham's way of water-borne gastronomes such as Belonesox.

Bearing in mind this environment, it will be beneficial to keep them in a well-planted tank. Leaving aside what other filtration/aeration system you have in place, a tank well stocked with plants will supply oxygen to the water. In addition to this assistance, like all groups of animals, a dominant hierarchy will inevitably occur and good planting will provide an area of hiding for the less boisterous in the school. Here they will find sanctuary and enable them to seek out food,

both provided by the plant and those little morsels caught up in the thicket. Finally, of course, the plants will provide cover for small fry which, otherwise, might end up on the menu of their parents, etc.

It has, generally, been found that a temperature of around 23°C is the ideal temperature for these fish. Keeping them at higher temperatures, particularly 27°C or above, for any lengthy period of time (more than a month), has a tendency to temporarily sterilise them.

As with any species, of primary importance in feeding is a balanced diet. The correct proportions of carbohydrates, fats and protein, coupled with essential minerals and vitamins, is vital to get the best out of your

fish. Enough development has taken place in recent years to suggest that most proprietary flake foods will provide a good broad spectrum of diet within these boundary elements. Freeze-dried or gamma irradiated frozen foods are also taken as excellent supplements, however, none of these seem to give these fish (or any other for that matter) that extraspecial something that live foods provide. Caution is recommended here, however, as irresponsible feeding of unclean live foods, such as tubifex worms, can have the opposite effect to that required, in that their origins are polluted and without keeping them in clean, running, water for 24 - 48 hours to clean out their stomachs, you may well impart disease into your fish rather than give them a boost!

When it comes to breeding your fish, it rather depends on your intent as to the approach which you take with them. You may be a first time fishkeeper, having just purchased a few specimens at your local pet or aquatic shop. After acclimatisation, you've put them in your tank and, all other things being equal, i.e. water conditions, probably find some fry nesting in the plants before you know it. This will be your first exciting experience of watching and seeing your fish breed for you. Your achievement in providing a stable environment for this to happen may, in itself, be reward enough. You may, however, go on to other things or you may decide to do a little biology yourself. Next time, why not visit your aquatic outlet at a quiet time where you can study the specimens for sale. You will, of course, by now, know the difference between male and female fish and see whether your dealer keeps them in separate tanks in his shop. If he does, why not pick out 2 or 3 males of one type that you particularly like and also purchase half a dozen females of the same

type, again with colours/patterns that you like. Now you're down to genetics - see if you can stabilise a particular pattern or trait by pairing of your fish, crossing daughters back to fathers and/or sons back to mothers. Whatever you do, however, be a good scientist and maintain well-documented notes of what you did, what happened and the results. Once you've progressed with this, you might then decide to really experiment and try some cross-type breeding. Who knows, the next Platy strain might not be a 'Mickey Mouse', but a 'Minnie Mouse' named after you!

When plenty of food is given, remember there is a fine line between this and over-feeding and polluting the tank. Platies do not usually eat their young, particularly if you've followed the planting rule and included some Riccia or, more preferred, Nitella. An average brood might be around 40 to 45 youngsters and will do fine in five gallons of water for about a month. After this period, they should be divided into lots of ten or less per five gallon tank and, of course, split by sexes soon as this becomes apparent. Better growth has been found if some live food, such as Brine Shrimp Nauplii, early on, and Daphnia later, is given from day one up to two or three months of age. Proprietary fry foods are fine, however, I chipped canned fish or beef or scrambled eggs - any slight over-feeding here which you don't spot and siphon from the tank, will foul the water and jeopardise the life of your little friends!

To give you some idea of what can be achieved, by crossing wild comets to aquarium-bred gold Platies, a grey-black wagtail was achieved and, from this, by mating brothers and sisters, the black wagtail pattern was fixed on a golden body. A similar result was achieved by crossing the grey-flacks back to gold Platies. From

this, the black wagtail characteristic has been placed into other strains by similar matches. As you will note by looking around some of the large aquatic outlets or by reviewing the lists of the specialised livebearer societies, a myriad of different types and strains is now available to the fishkeeper, hobbyist, specialist. If you have already tried experimenting or have a go after reading this article, why not share it with us/others and send in a copy of your notes/write up a description of what you did, how you did it and the results.

In completing this article, it should be noted that these fish remained under the biological nomenclature of *Platycoecilus* for some 85 years. It was, in fact, Guenther's successor at the Natural History section of the British Museum, C. Tate Regan, who, after extensive work, found that the Platy and the Swordtail were rather similar if one discounted the visual differences of length of tail and colouration. What he found was an almost identical make up of the gonopodium in both fish. This modified anal fin is remarkably similar in Platies and Swordtails, but differs considerably when compared to those of Guppies and Mollys. Having said this, a particularly persistent male Platy might just overcome the structural differences to entertain mating with a female Guppy, but the likelihood of it being a viable match is almost nil. The ripe sexual cells of the Platy and the Swordtail contain 24 chromosomes and are matched fairly well, whilst those of the Guppy and Molly contain only 23. Similarly, the body cells are also mismatched with the Platy and Swordtail having 48, where those of the Guppy and Molly have 46. Hybridisation is, therefore,

extremely unlikely.

Whilst Guenther had the genus *Xiphophorus* available to him, he could not, in his study and naming, draw the conclusions that Regan later did, as he did not have male Platies to compare with the male Swords, and even if he had, it would have been likely, because of the vast visual difference, that he would have kept them apart, particularly as there were no intermediate species between *Platycoecilus maculatus* and *Xiphophorus helleri*. Two major discoveries later filled in the gaps. In 1932 another member of the Platy group was discovered, *Platycoecilus xiphidium*. This had a small, but strong sword-like tail. To finally seal the fate of the genus name, along came *P. pygmaeus* in 1943. This was the third Swordtail found and a Swordtail not so much for its sword-like tail. (It was, in fact, smaller than the sword of the Platy, *xiphidium*, but by virtue of the structure of its gonopodium, which was more like that of *helleri*. The death knell of *Platycoecilus* was sounded by the later work of Donn Eric Rosen and Dr. Myron Gordon, who came to the conclusion that this name was superfluous, as there seemed to be no systematic way to separate the four Platy species and the three Swordtails and, by reason of it being the older name, *Xiphophorus* was used to describe the entire group of seven forms.

(Thanks to all sources, including Gordon, for enabling this article to be put together.)

PDSA PET PROTECTORS

Free Pontin's Holiday for Lucky Pet Protector

The PDSA have just announced that youngsters who enrol in their children's club - Pet Protectors - before the end of August, 1998, will each receive a free baseball cap and the chance to win a Pontin's family holiday. The holiday is for a family of four at one of Pontin's family favourite locations in the UK.

Donna French, the Pet Protector's Club Organiser says:

"The Pet Protector's Club is ideal for all animal lovers. It's a great way to find out about creatures great and small and the importance of responsible pet ownership. There's also the opportunity to win exciting prizes like the family holiday."

Membership to the Club costs from £4.00, which entitles members to a Pet Protector badge, membership card and regular copies of "Animal Antics", the Club's quarterly magazine.

The Club was launched by the PDSA in 1993 to encourage young animal lovers to learn more about responsible pet ownership in a friendly and informative way. Well-known TV presenters Cheryl Baker, Neil Buchanan and Paul Hendy are presidents of the Club and attend Pet Protector events whenever they can.

In 1997, the PDSA celebrated its 80th Anniversary, having achieved its present-day position as Britain's leading veterinary charity from one small, damp cellar in Whitechapel in London's East End.

To join the Pet Protector's Club or to find out more information write to:

Donna French,
Club Organiser,
Pet Protector's Office,
PDSA,
Whitechapel Way,
Priorslee,
Telford,
Shropshire,
TF2 9PQ.

Life with 'Goldie' by Mac



"Swimming round all day can get quite boring - I think I'll play a trick on Pebble"

Glug! Glug! Glug!

"Very clever Goldie - Now spit the water out again"

STOCKING A SMALL POND

We will assume that you either have a well established pond or that your new pond has been filled with water for at least one month to mature. Your thoughts at this time in the season may well turn to the purchase of new fish and be thinking beyond many novice pondkeeper's choices, i.e. goldfish, orfe and koi.

There are many native species of fish available which will enhance your pond and perhaps breed to conserve the species. When stocking your pond you need to assess the surface area of the pond not the gallonage. A pond 4' deep will support no more fish than one 2' deep if the surface area is the same, as the surface area denotes the amount of oxygen that will be available to the fish.

For a very small pond or water filled tub, some of the species that you may wish to procure might be:

White Cloud Mountain Minnows are striking little fish which only grow to about 1.75". They have a silvery background colour with bright red fins with white edges. In even the smallest pond you will be able to keep a shoal of these and if your pond is well planted, you will probably be able to breed your own White Clouds.

Minnows measure between 2" and 4" fully grown. The males will develop a striking colour pattern in the breeding season. Minnows can become quite accustomed to being with people.

Three-spined Sticklebacks can also add excitement to a small pond. During the breeding season the males develop a bright red belly and throat. The male builds a nest on the pond floor with plants and twigs and cajoles the female into it. It is advisable to

have a large number of females for each male as his breeding technique is quite rough and can easily kill the female. Sticklebacks will tolerate a wide range of water conditions, some even living in brackish water. They are a bottom feeder and will prefer live foods such as larvae or Daphnia, but will also feed on proprietary brands of food.

If your pond is small enough to freeze over in cold weather, you should ensure that your fish are housed in a tank in a cool, frost-free area to overwinter.

A wide variety of Bitterlings are available from various parts of the World. Bitterlings are smaller relatives of the Carp family. At spawning time the female will lay a few eggs in the breathing hole of a Swan Mussel. The male follows the female and sprays its milt (sperm) over the area around the spawning site. The breathing of the Swan Mussel ensures that the eggs have plenty of oxygen during the time prior to hatching. You will not be able to breed Bitterlings without a Swan Mussel. This is known as a "symbiotic relationship". When the young fish leave the Swan Mussel they are fully able to swim. The size of the different Bitterlings varies between 2" and 5". The base colour of all is silver, but the males in particular can show stunning rose, blue and green colours over the base silver. Their fins may also be patterned with a white and black spots, for example, which provides a lacy effect.

If you want something a little more unusual to feed from the bottom of your pond, you could purchase Stone or Spiny Loaches. These are both species native to the UK and will grow to approximately 5" long.

All of these fish are striking in their own way and you also have the bonuses of knowing that they will not 'outgrow' your pond.

FISHING ON THE NET

by Roger Winter

One of the most useful features on the Internet are the search engines.

There are several of these and they are used to locate sites (known as pages) on the Internet. You can type in the word "FISH" and you will be offered a bewildering array of pages that contain the word "FISH". These will range from pages on fish as we know them, to perhaps pages on the game "Go Fish" or even pages dedicated to the rock star "Fish". To save time you will need to refine your search by searching on the words "TROPICAL FISH" for example (you need to enclose the words you want to search on in quotes). You will then only be taken to sites containing the words "TROPICAL FISH". There are ways of refining the search even further and instructions on how to do this are contained on the various search engine pages.

This time I was asked to look at some Killifish sites to go along with the feature on the British Killifish Association.

Using the search engine the word "KILLIFISH" produced 1,068 pages containing this reference. These range from personal home hobbyist's pages to the pages of Killi clubs and organisations, as well as local conservation, university and scientific pages. This demonstrates the wealth of information available on this

group of fish. I explored in greater depth only three of these:

INTERNATIONAL KILLIFISH ASSOCIATION
<http://www.killinet>

Their introductory page explains what Killies are and contains lots of links to pages within the site which expand on the care, breeding, etc. of Killies. The other pages consist of:

GALLERY - contains photographs of various Killies.

LIGHTING - lots of very interesting articles on the various types of lighting available.

MASTER INDEX - all the Killies are classified here by continent and species. Like most web sites, they are always under construction and at present only some of the African species are indexed. Clicking on a species will take you to photographs of that species.

IMAGE and ALBUM - ways of accessing the MASTER INDEX.

TRADING POST is not functional yet.

NEWS gives details of various international Killi events.

AMERICAN KILLIFISH ASSOCIATION
<http://www.aka.org>

This is an excellent site with lots of pages.

The new



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HOME FURNISHED AQUARIA

by Malcolm Goss

In the first part of this article in the Spring 1998 issue of "Fishworld", I generalised on the practical comparison of planting aquaria with that of planting your garden. Many of us have both a community of fish and plants, which makes up the home furnished aquarium. The fish and plants used have originated from all parts of the tropical world and in their native habitats would never have seen each other, let alone live side by side.

Plants can be divided into three groups: plant cuttings, rooted plants and floating plants.

Cuttings of plants such as *Cabomba caroliniana* - commonly named *Cabomba* - are often purchased by the new aquarist. Often this is purely because they can be purchased quite cheaply, will cover a large background area in the aquarium and the purchaser is often told by the retailer that these plants are easy to grow. This is not really true. Firstly, this plant requires soft water. Secondly, it requires a high level of light. The aquarist may also purchase this plant because it is the only one on offer by the retailer! Even with good levels of light, this plant will lose its colour quite quickly, reverting to a pale green and will develop into a very weak specimen. With average levels of light, it will still die away within months, leaving debris covering the substrate of



Cryptocoryne sp.

your aquarium.

This advice can be generalised to include most other plant cuttings, but, of course, there is always the exception to the rule and I will discuss these later.

Floating plants are often considered in the aquarium. They have a specialist use within a breeding set up in that their roots provide cover from predators for fry and eggs. In furnished aquaria with good lighting, these floating plants will flourish quickly, forming a dense mass of plant right across the surface of the aquarium, which will cut out the light from the rest of the aquarium, halting any other form of plant growth.

Rooted plants are far the better plants for a furnished aquarium, but the rarity or the rate of growth of the plant will determine its cost. Whilst all of us would like our aquarium to be a veritable underwater forest, for many aquarists this would be a costly exercise to create straight away. After all, gardeners would not expect to create landscapes immediately by purchasing the plants on one visit to the garden centre. Even if cost was not an issue, you would be hard placed to find all the species you may require at the outset.

Collecting plants should be a pleasurable experience and, depending upon the size of your aquarium, this may take years rather than months.

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The FBAS pond exhibit at GROW 1998

(See cover for completed pond)

With this in mind you may well turn to plants being offered for sale via mail order. Some plants may be listed individually by the supplier, but if they are not in stock these may be substituted by a plant or plants you do not require. Plant collections can be equally disappointing when they arrive and may be made up from very weak rooted plants or cuttings measuring only a few inches in length.

The three major plant families provide the aquarist with a wide variety of foliage in leaf shape, colour and size and are very contrasting in their requirements. The three species I speak of are *Cryptocoryne*,

together in an aquarium, they will not continue to make any growth. However, I have not tried this myself.

Cryptocorynes have all the variety of colour and contrast of leaf shapes you should need to make your aquarium truly magical, but even these have their problems and moody temperaments, even if you talk to them!

In the Autumn 1998 issue of "Fishworld" I will be telling you about growing *Cryptocorynes* and *Echinodoras*.



Water Lettuce

Echinodoras and *Vallisneria*. *Vallisneria* is best described as a grass-like plant and apart from requiring good levels of light, is reasonably undemanding to maintain. Each of the species vary in size. *Vallisneria gigantea* has leaves that grow up to 2 metres long. This is too long for the average living room aquarium. Generally I would recommend *Vallisneria spiralis*, which has straight tape-like leaves or *Vallisneria spirifolia*, which has spiralled tape-like leaves. Both make attractive background plants for your aquarium, but it has been noticed that if both species are planted



LONDON AQUARIUM'S LATEST STING-IN-THE-TAIL

The London Aquarium had a pleasant surprise recently when its largest female Southern Stingray (*Dasyatis americana*) gave birth to a healthy baby Ray.

The Stingray is the first born in the Aquarium and was named "Sweep" by our Aquarists. Once he leaves the Aquarium's 30,000 square foot Quarantine Department, the latest arrival will be part of the new born display.

Female Southern Stingrays have the unusual ability to have several births at different times, all from a single copulation. They are also able to store fertilised eggs for several years, controlling when they decide to give birth.

Once the London Aquarium's "Adoption Programme" is running, Sweep will be one

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Tetra CORAL CREATIONS



A Tetra (USA) line that became unavailable in the UK three years ago. Recently a small stock was identified in the UK warehouse and Tetra have agreed to its **sole distribution** in the UK through the Federation of British Aquatic Societies' Merchandising at **absolutely knock-down prices!**

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retail at **£23.25** can be yours for merely **£6.80** and for a "Mini Brain Coral" in either white or natural, you pay only **£2.00 instead of £6.75**. Do not forget that these recommended retail prices are now three years old, so you are getting even better value!

This unique opportunity is only available to you through FBAS Merchandising. Obviously the cost of post and packing would be high on items of this kind, so we are offering **Coral Creations** for sale only at open shows and major shows and only whilst stocks last.

Enquiries via the Merchandising Officer - address in your Year Book!

of the animals available for adoption. The lucky person who chooses to adopt him will also have the opportunity to rename him.

The London Aquarium has a vital conservation role in terms of captive breeding. This is necessary to maintain and establish viable populations of threatened species. Captive breeding means that endangered species can be bred and increased in numbers in a protected environment.

As part of this national captive breeding programme, the Aquarium has also enjoyed seven broods of Seahorses. The newest now reside on our 'newspaper' desk which gives visitors information on the latest events occurring at the London Aquarium.

Our Jellyfish breeding programme has also been very successful. We have two different species of Jellyfish that we are currently breeding: Moon Jellyfish and Upside Down Jellyfish. The breeding process started with five adult Jellyfish, who have so far produced at least 1000 offspring.

THE LONDON AQUARIUM (Part 1)

The Federation of British Aquarists has arranged for its quarterly Assemblies to be held in one of the conference facilities at the new London Aquarium. You can obtain a discount as a reader of "Fishworld". To "initiate your taste buds" we will be reviewing the London Aquarium in this and the next issue of "Fishworld".

The London Aquarium offers a handy leaflet showing the areas, levels and facilities available to visitors. We found this most useful when visiting the exhibits.

The Basement Level

We entered at the "Freshwater Streams" exhibit. This is a large open topped tank stretching the whole length of one wall. It

was built so that at the entrance end the tank top was placed high, and each tank then stepped down from the last, creating a waterfall effect. The tanks are made of 2" perspex. Birdsong is played over the sound system to enhance the illusion of the "Freshwater Stream". This doesn't detract from viewing and creates a pleasant background to the theme. To assist the viewer there was an illustration of fish the tanks were said to contain together with a three or four line description, but we found that the display was not always wholly accurate in that what was described was not always in the tank and additions had been made to the tanks, but not to the descriptive material - something we fishkeepers are not wholly unfamiliar with when visiting retail outlets!

Tank 1 - This tank housed Rainbow Trout (*Salmo gairdneri*). They were attractive fish in an attractive setting depicting a traditional British river bed, but without the Coke cans and other pollutants often now seen!

Tank 2 - A mixed tank of Barbel (something worth noting as they are now endangered), Grayling, Rudd, Wels Catfish (an introduced species), Silver Bream, and Gudgeon (not labelled). All of the fish have a little ground to do, but are all healthy and happy. Stone Loach were mentioned on the signage, but no matter how hard we tried, we could not spot one! If you are of average height you can look down into this tank.

Tank 3 - Primarily Rudd with a Barbel. Again attractive, healthy fish.

Tank 4 - Gudgeon, Wels, Bitterling, Dace and Sterlet. Minnows were supposedly in this tank, but we could not see any. We felt that this was probably due to the water feed to the filter, which would not have been adequate to prevent Minnows from finding their way into it and being lost in the filters.

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We felt this to be a shame as a shoal of Minnows could have provided a nice display.

We were quite concerned about the inclusion of the Wels in these tanks with smaller species of fish. It can be imagined that as the Wels grow towards adulthood the tanks will be secured of the other smaller species of fish.

We then crossed to the other side of the display and encountered the Atlantic and Pacific tanks. These are absolutely massive displays. The leaflet tells us that the Pacific tank holds over one million litres of water. The Atlantic exhibit is of similar proportions. Both can be viewed from all three of the stencys on which the Aquarium is housed.

The Atlantic exhibit houses Gilthead Bream, Pollock, Dogfish, Bullhuss, Starry Smooth Hound, Bass, Wrasse and Conger Eel. There were also some 'Flaties' which we could not identify and did not appear to be listed anywhere. There was also a shoal of Mackerel and some Cod. It is a large closed almost cylindrical tank.

The Pacific exhibit is very similar to the Atlantic setup and includes Brown Shark, Wobbegong, Black Grouper, Sand Tiger Shark, Leopard Shark, Red Grouper, Southern Stingray and Golden Trevally.

Smaller exhibits housed the opposite wall to the central tanks and housed Coral Catfish, Red Knobbed Starfish, Long-spined Porcupine Fish, Foxface Rabbit, Wobbegong, Atlantic Guitarfish and Dwarf Lionfish.

We then visited the Rivers and Ponds exhibits.

In this display there were some impressive Three Spine Sticklebacks which I would have loved to take home, Pumpkinseeds, Bitterling (Rhodeus and Acanthocobolus), Barbel (not mentioned in literature) and what appeared to be Minnows (perhaps moved from the Freshwater Streams tank away from

the Wels?).

Another tank showed off Grass Carp, Koi, Common Carp and Crucian Carp (not described). Some Carp Pox in this tank, but with Carp in it is there any wonder?

The next tank was a beautiful display of Common Bream, Sterlet and Tench. All fish were in super condition and the Bream were showing breeding tubercles - this could have been made note of to inform viewers what the marks were.

A further tank followed which housed Perch and Pike. The Pike seemed to be the centre of attention to viewers on that day.

In this area there is also a display of juvenile Seahorses, Brine Shrimp, juvenile Jelly fish (Ephyrae?) and some Ray egg cases, upside down jellyfish and polyps.

You can sit and peruse exhibits for a while on seats provided by the larger exhibits and you can learn about the world of fish by playing a short video, each lasting from 1 - 5 minutes, on such subjects as: What is a fish, fish as parents, fish feeding, fish senses, and schooling.

Despite my one or two negative observations, I would recommend that anyone vaguely interested in fish (or wishing to become interested in fish) visit this facility. All age groups are catered for and there are lifts to the various levels for those who are infirm or disabled. Please note that wheelchair users are admitted free into the aquarium. For the hungry there is a McDonald's restaurant within the complex.

Next issue we will review the Ground/ Sub-Basement levels.

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GARDEN/POOL LIGHTING

SOLAR POWERED

Wagner Spraytech has just introduced a range of six stylish designs some of which can be operated by movement sensor and are wall-mounted. All switch themselves on automatically when the daylight reduces enough to require lighting and switch off when light becomes good enough not to need lights. The range all have a two-year guarantee with prices starting at £64.78 (Pagoda) and £67.41 (Dome). Wagner Spraytech, Haslemere, Tramway Industrial Estate, Banbury, Oxon OX16 8TY Tel: 01295-265353

Wonder Stands say their Solar Light will recharge in 6-8 hours even in cloudy weather. The detachable solar panel has a life of up to ten years and can be positioned outside a shed/conservatory with the light inside. Solar Light prices start at £39.99. Wonder Stands, 59 Brookscroft, Forestdale, South Croydon, Surrey CR0 9NB Tel: 0181-651-0418

Contimex market their Solite Moonlight Marker in pairs for around £20 (+ p&p). They can be positioned beside a path or in flower beds and will glow for up to eight hours, fully charged. Contimex-Solite, PO Box 94, Eastbourne Road, Uckfield, East Sussex TN22 5YZ Tel: 01825-766435

Intersolar have available a range of solar powered decorative lighting including the Light Fantastic which is mounted on a pole to be adjusted to four heights at a cost of £39.99. Intersolar, Cook Lane, High Wycombe, Buckinghamshire HP13 7DE Tel: 01494-452945

MAINS LIGHTING

Elstead Lighting have a range of ten designs available in four different finishes - all with a 20-year guarantee. PIRs are available as an optional extra to control up to twenty-three linked 100w lights. Elstead Lighting, Mill Lane, Alton, Herts GU34 2QG Tel: 01420-82377

Hozelock and Erin-Gardena provide low voltage outdoor lighting which will not give an electrical shock even when the electric cable is damaged. Both ranges can be controlled by PIR, button or timer and are coupled to a 24v or 30v transformer to reduce the power to safe levels. Hozelock, Haddenham, Aylesbury, Bucks HP17 8JD Tel: 01844-291881 Erin-Gardena, Dunhams Lane, Letchworth Garden City, Herts SG6 1BD Tel: 01462-475041

Noma Lites produce a Moonray 12v automatic garden lighting system with a range of six heads available. The Pagoda basic kit consists of two lamps at a cost of £62.99 (+ p&p).

Silhouettes is a new low-voltage halogen system and the basic two lamp kit costs £17.99. Noma Lites, Leisure Products Division, Southley House, Avro Way, Brooklands, Weybridge, Surrey KT13 0YU Tel: 01932-336012

Tensor Marketing also have a four light halogen system available which can be wired to a timer. This costs £49.95 (+ p&p). Tensor Marketing, Yarm Road Industrial Estate, Darlington DL1 4XX Tel: 01325-469181

POOL LIGHTING

Nulite Lighting System's range can be mounted on the surface or down to 17.5 (m). The transformer, lamp and approx. 14' (4m) cable costs £82.19. Nulite Lighting Systems, Unit 26, Wyde Road, Bridgwater, Somerset TA6 4DH Tel: 01278-442224

Blagdon Garden Products' Economy Pond Light comes supplied with approx. 33' (10m) cable and five coloured lenses at a cost of £68.33. The Floating Pond Light has an 8" (20cm) clear plastic globe, double insulated transformer and cable at a cost of £92.38. Blagdon Garden Products, Bristol Road, Bridgwater, Somerset TA6 4AW Tel: 01278-446809

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"A COMPLETE GUIDE TO THE FRESHWATER FISHES OF SOUTHERN AFRICA"

Paul Skelton
ISBN 1 86812 350 2
Priced £18.95 from
Millbank Books, The Court Yard,
The Old Monastery, Windhill,
Bishops Stortford, Hertfordshire
CM23 2PE
Tel: 01279-655233
Fax: 01279-655244

Reviewed by Adrian Dempsey

It seems like a trick question on quiz night at the local club - "Would you find Mosquito Fish, Guppies, Swordtails, Sunfish, Bass and Trout in South African waters?" The answer is YES - they are some of the 18 alien and translocated species now resident in South African waters.

How and why they got there is one of the many interesting items related in "A Complete Guide to the Freshwater Fishes of Southern Africa" by Paul Skelton. However, the alien species are few when compared to the many and varied species covered in this book - from Freshwater Mullet through the estuarine Gobies and onto Barb, Catfish and Cichlid laden lakes.

I'm not usually a fan of books with drawings of fish, preferring photographs, but these are generally very good and usually recognisable. Yes - that's the only criticism. In some instances there are additional drawings to illustrate breeding colours or local variants. I should add that there are a number of full colour photographs showing habitats and these are supplemented



throughout the book by useful drawings and diagrams

Each colour drawing is accompanied by a location map showing its habitat, a description giving ray counts, the distribution biology and ecology of the fish. Usually there are also notes referring to its use (i.e. whether it is an aquarium fish, a target for anglers and whether it is edible!). There are also hints on how to catch it! Even more unusual - and sometimes amusingly - each fish comes with three names: English, Latin and Africans. When coupled with the size and a summary of the genus and family information, you are presented with a plentiful amount of information in an easy to follow and pleasing to the eye format.

In addition to the detail about the fish, this book has an introduction and history of ichthyology and details of the biology and ecology that every aquarist would benefit from reading.

In conclusion a definite addition for the society library!

INLAND FISHES (Of India and Adjacent Countries)

Purnesh Kumar Talwar & Arun G. Jhingran
Oxford & IBH Publishing Co. PVT. Ltd. New Delhi
ISBN 81-204-0639-7 (2 Vol. Set)

Reviewed by Roger Crew

Covering 930 species from 326 genera from the Indian sub-continent, these two volumes are undoubtedly a product designed primarily with the fisheries industry in mind. They serve, however, to give the hobbyist a valuable and rare taxonomic reference. This publication contains many line drawings but NO photographs. It follows therefore, that if you are seeking a coffee table picture book, this is not for you. If, on the other hand, you wish to purchase a fairly definitive work that describes many species probably not covered elsewhere in your

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aquatic library, it is most probably a gem to be coveted!

For the aquarist who studies Barbs, Loaches, Garra, Labeos or Catfish, this is a veritable treasure trove, but similarly for the person who has a liking for the oddball fish or rarity, this serves as a valued reference.

Despite my 'falling for' these books on all of the above counts, I must say it is a refreshing read, purely due to the presentational style and technical information imparted even for the familiar species. The systematic index follows the sequence of class, order, family, genus, and species without becoming cumbersome and explaining in some detail each level i.e. characteristics of the order, followed by keys to the families, description of family characteristics and so on through sub-families and genera until each species is described. The species descriptions are informative and cover such information as ichthyological references, common names, distinguishing characteristics, geographical distribution, remarks and fishery information, all of which lead to a quick identification.

Finally, the second volume ends with a glossary, a massive literature list, and index of common and scientific names.

This review is unusual in so much as these volumes do not form a new publication, being published as early as 1991. I have reviewed it now as the opportunity to obtain the set - normally only obtainable in India - has arisen. Paul Corbett of CI-Aquatics, who imports fish from India, can obtain copies in limited quantities at a cost of £105.00. Should you require a set, please contact Paul on 01983-721412.



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(From "Daily Mail" 16/10/97)

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JUDGES CORNER



By now the showing season is well under way. Has anybody seen any new fish at these shows?

I attended a show last week, and low and behold I spotted a fish that I had seen for the first time at the end of last year. The fish was identified as "Astyanax spec. Columbian" and we have already included this fish on the size sheets. This fish was identified from the Mergus Aquarian Atlas, Vol. 5, page 54. Although the size is quoted at 50mm, the fish seen at the end of last year was 65mm in length. My questions are, "Has anybody bred these fish?" and "How do they behave in the confines of your tank at home?" As you will see from the illustration in Mergus 5 - if you are able to access one - the colours on the fish are very striking, but the one I saw last year seemed to show even more colour than the illustration suggested.

While the Judges and Standards Committee were debating the size adjustments just before Christmas, it was thought that there could be some misunderstanding over the adjustments we had been requested to make as all of those received had been for **increasing** sizes and none for **reducing** sizes. I would like to ask Judges that when they look at a class of fish - for example Danios - how many full size (according to FBAS Book 6) fish do you see on the show



A. Columbian

bench? I believe that the average size for a Danio on the bench currently rates between 10 and 14 points. This would lead me to also believe that there is a case for reducing the size of this family of fish. I am, therefore, looking for someone to carry out some research over the next six months in order that we can come up with more accurate sizes for Danios, which will probably result in the current sizes being reduced. I do not want to restrict this exercise to just Danios, as I believe that there are other fish sizes which could be reduced. This will be an on-going exercise as I am of the opinion that if we can make the fish sizes more realistic it may have the effect of increasing the numbers of entries seen at open shows. So, please put on your thinking caps and send me some evidence where there is a discrepancy.

The discrepancies in fish sizes have come about largely because of the mis-identification of fish in the past. We now have many more publications available to us to assist with the accurate identification of our fish, which has made these anomalies more apparent.

Remaining on the subject of fish sizes, I am sure that regular exhibitors are more than aware that certain fish remain at home on show days because the size has been exaggerated in FBAS Book 6. I would, therefore, like to extend an invitation to all exhibitors to write to me with their recommendations on any size adjustments they would like to see.

With information from both fish keepers and fish judges, we should be able to make a more qualified decision about the size a fish should reach in adulthood.

I can be contacted at the address below, or if you see me at a fish show, please come and tell me about your observations.

Colin Pannell,
 Judges & Standards Committee,
 9, Edwin Road,
 Hastings, East Sussex TN35 5JT

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1998 SHOW DATES AND EVENTS

Rule Codes: A = A of A; FB = FBAS; FN = FNAS; FS = FSAS; U = US of A; Y = YAAS;
 B = BKKS; BK = BKA; I = International Goldfish Standards;
 N = NEFAS; C = CAGB

| | |
|---------------|---|
| 6.6.98 | SPASS (Coldwater) (I), FBAS Assembly |
| 6-7.10.98 | Worthing & District BKKS 8th Open Show (B) |
| 7.6.98 | Erith AS (FB), Darby & DA (Y) |
| 12.6.98 | Euopaicher Anabantoid Club Auction (Y) |
| 13.6.98 | Bristol Tropical (FB) |
| 14.6.98 | Bracknell AS (FB), Tameside AS (FN), Castletord AS (Y) |
| 21.6.98 | Welland Valley AS (FB), Rothwell & Wakefield (Y), Worthington AS (FS), Cotswold AS (A) |
| 27.6.98 | AMGK Goldfish (I) |
| 27-28.6.98 | Middlesex & Surrey Borders Open Show (B) |
| 28.6.98 | St Helens AS (FN), York & DAS (Y), Seascale JFS (FB) |
| 5.7.98 | BKKS Worthing (B), Huddersfield AS (Y), Thames Valley Cats (A) |
| 11.7.98 | Port Talbot AS (FB), Southend Leigh & DAS (FB) |
| 19.7.98 | Bournemouth AS (FB), BKA NE York (BK) |
| 26.7.98 | Mersayside AS (FN), Oasis FC Auction |
| 2.8.98 | Yorkshire Koi Society (B) |
| 9.8.98 | Grimby and Cleethorpes AS (Y), Salisbury AS (FB) |
| 18.8.98 | KAAS Show (FB), Perth AS (FB), Three Counties AG (FB) |
| 23.8.98 | Glenrothes AS (FS) |
| 30.8.98 | TTAA (Area Group), (FB), USA (USA), Swallowfield (A) |
| 5.9.98 | Bristol AS (I), FBAS Assembly |
| 6.9.98 | Alden AS (FN), Crumlington AS (FB), Cardiff AS (FB), Wyke AS (Y), Leics BKKS Show (B), South London AS (A) |
| 7.9.98 | ASAS Auction (FB) |
| 12.9.98 | Hounslow AS (FB), Clacton AS Auction |
| 13.9.98 | Mid-Somerset (B), Silkton AS (FN), South of Scotland AS (FS), Lincoln AS (Y) |
| 19.9.98 | Fledhill & Reigate AS Auction, Plymouth AS (FB) |
| 20.9.98 | Mid-Sussex AS (FB), CAGB Northern (C) |
| 21.9.98 | Otley AS (Y) |
| 26.9.98 | NGPS Goldfish (I) |
| 27.9.98 | Darwan AS (FN), Fair City AS (USA), Northern Koi Club (B) |
| 4.10.98 | Littlehampton & Bognor AS (FB), Basingstoke AS (A), Grangemouth AS (FS) |
| 11.10.98 | Warrington AS (FB), Doncaster AS (Y) |
| 18.10.98 | Halifax AS (FN), Solway AS (FS), West Cornwall (FB) |
| 24-25.10.98 | British Aquarists Festival, Manchester (FN) |
| 1.11.98 | Bradford AS (Y) |
| 30.10-1.11.98 | Supreme Festival of Fishkeeping, Weston-Super-Mare (FB) |
| 15.11.98 | FNAS Auction, Billingham AS Auction |
| 5.12.98 | FBAS AGM |

NOTE TO SHOW SECRETARIES

The above dates are those available at the time of going to press. For the latest, most accurate dates and venue information (and trophy allocations where applicable), please refer to the Quarterly Supplement issued by the FBAS giving details of shows around the country. The Show Supplement is available, price 50p post paid free.

SHOW INFORMATION

Dept. FW 22, Flamingo Avenue, Worsley, Middlesbrough DL8 6DL
 In order to provide the most complete service to all Societies, please communicate your show information to the same address.

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