FISHWORLD MAGAZINE©

AUTUMN 1999

Malaysian Fish Farm Visit
Aquarama 1999
Troublesome Tiger Barbs

Nutrafin Maxi Offer
Fishing on the Net
African Fish Farm

£1.95 (UK)

FBAS

EDITORIAL

Dear Readers,

Another truly international issue with articles either about or from Singapore, Malaysia and South Africa.

Unfortunately there was not enough space to get in the article about the visit to the Singapore fish farms - including one farm which produces high quality Koi. That is scheduled for the Winter 1999 issue along with articles on a new discovery from India, Cichlids and Amphibians, to name but three of the articles planned already.

It was a superb visit, but unfortunately I missed some of it due to a bout of food poisoning and dehydration! That just means we'll have to go back again in 2001.

Also in this issue Hampton Court Flower Show with photographs of the Federation exhibit and some of those submitted by our sponsors.

Don't forget to submit your open show award cards for the Bronze, Silver and Gold Awards. Some of you must have amassed quite a few over the course of the season!

Sue Crew,
Editor

CONTENTS

	Page
Editorial	2
I Had A Farm In Africa	3
Tetra Web Site	5
Get The Max	6
Nutrafin Max Offer	8
Behind the Scenes At Hagen	9
Discus Health	12
Troublesome Tigers	19
Dear Tanqy...	20
Book Review	21
Fish Shapes	23
Feeding Habits	23
Stocking Your Tank	23
A-Z Of Fishkeeping	24
Tiger Barb	25
Hampton Court	26
Fishkeeping Through The Millennium	27
Fishing On The Net	30
Book Review	32
Malaysian Fish Farms	33
Small Ads	36
My Holiday	37
Aquarama	39
Conservation Issues	41
Judges Page	48
Merchandising List	49
Show Dates	51

COVER 'PHOTO

Water Hyacinth

Courtesy
Roger Crew

Contributions for the next issue should be posted to me by
25th October, 1999
at the address in the FBAS Year Book (1999) or
Sue Crew c/o Albany Print & Design - address below

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I HAD A FARM IN AFRICA

by Leslie Ter Morshuizen
(Aquaculture Consultant, S. Africa)

Degradation of the natural environment and pressure from environmental groups have resulted in a decrease in the proportion of our ornamental fishes that are harvested from the wild. This, combined with the ease with which most species can be cultivated, has resulted in many species being captive bred. Often these fish are farmed on a vast scale to supply the ever increasing demand for high quality fishes. I had the privilege of managing such a farm in sub-tropical southern Africa for two years. One of the oldest ornamental fish farms in South Africa, Valley Fish Farm was established 18 years ago to fill a niche in the local market. Initially the farm concentrated on livebearers and goldfish, but more recently a major switch has been made towards the production of Malawi cichlids.

PONDering?

Due to the high clay content of the soil and shallow subterranean water-table, extensive use can be made of earth ponds. A total of 40 ponds, each holding around 100 000 litres are used for growing up the fishes bred in the hatcheries. Technology is basic and the best possible use is made of all available resources in combatting pests, utilising the elements and producing good quantities of high quality fishes.

The climate is superb for nine months of the year. Unfortunately the water drops to around 20°C (cooler during the short cold spells) during the three months of winter, necessitating the use of plastic tunnels to maintain the water temperature above 24°C. Summer water temperatures remain in the region of 30°C without the use of any insulation.

The tunnels are constructed by bending suitable lengths of 30mm steel piping into a rough arc, placing these across the earth ponds 2m apart along the length of each pond and covering them with heavy duty, clear plastic sheeting. A wall is built on either end to add additional strength.

Harvesting is undertaken with a seine net while simultaneously pumping the water out of the pond. The net's mesh must be fine and the fabric soft to prevent damaging the fishes. It is interesting to observe the distinct behavioural reactions of the different species of fish to the seine net. Certain species, such as *Labidochromis caeruleus*, are naive and group in midwater, presenting an easy catch. Others, such as *Haplochromis horei* and *Pseudotropheus socolofi*, are extremely sneaky and avoid the net by hiding in the uneven substrate; the South American *Cichlasoma synspilum* escapes by jumping over the net! Once the dam is empty it receives a generous application of lime and chicken manure and is left to dry. After a few days the dam is refilled with river water and infusorians are given two weeks to colonise the fertilised pond. Fish fry are then brought from the hatchery and placed in the pond to grow up to a marketable size. Malawi cichlids are stocked at a density of about 1:30 (fish:litres of water) whereas livebearers grow equally well at a density of 1:10. Artificial feeding in the ponds is minimal due to the rich natural food supply, and the harvested ponds produce fish of exceptional colour and size due to their bountiful natural diet. No filtration or aeration is supplied to the ponds.

Pests and problems

One often hears the expression that 'if it was easy everybody would be doing it' and this was never more true than for ornamental fish farming. By its very nature

the product is sold based on its appearance, therefore all potential negative effects have to be combatted in advance. Besides the obvious factors relating to the genetic quality of the brood stock which affect all fish breeders, rearing fishes in the great outdoors has its unique problems. In the African context the first problem is the 'platana' (*Xenopus*), a predatory aquatic frog. A dozen of these ravenous predators are capable of totally wiping out all the fry in a pond. Fortunately they cannot jump to any great extent and are effectively excluded by surrounding the ponds with a 1ft high, smooth sided, vertical wall. During the summer months the growth of grasses is so rapid that two labourers are employed solely to slash the grass around the ponds to prevent the platanas from climbing over the barriers.

During the winter months growth of most species in the ponds comes to a halt. This makes providing customers with a constant supply of certain species difficult as sufficient fish have to be bred over the summer months and some held back to sell during winter and spring.

While the heat of spring and summer is ideal for the growth of the fishes it also presents problems. The plastic covers must be removed from the tunnels to prevent the ponds from overheating and cooking the fish. Furthermore, the tunnels containing 2000 tanks have to be covered with 80% shadecloth to protect the fish from excessive heating. Spring and summer midday temperatures average around 35°C. This means that one has to be extremely careful when harvesting ponds that the buckets into which the fish are placed do not heat up too much. Then, when placing the fish in quarantine tanks indoors it is necessary to do so slowly for fear of cold shocking the fish and bringing on an outbreak of white spot disease.

In terms of pests, aerial predators are excluded by the plastic covering the tunnels during the winter period, for the rest of the year hail netting is hung over the tunnel frames to keep out birds and dragonflies. Of the avian predators only the cormorant is a potentially serious problem. These birds are bold and extremely effective at harvesting ponds for their own use. This is so much so that an entire pond of koi fingerlings was lost over a three week period to what is believed to be a single cormorant. Fortunately the tiny malachite kingfisher has a small appetite as they find a gap and climb in under the netting. They have even been seen hanging upside down from the net looking for fish.

Not all fishes are compatible in ponds. This may seem an obvious statement, but the implications are in fact more subtle. In a pond situation the most aggressive fishes can be kept together without problems arising, presumably because there is sufficient space for them to avoid each other. Yet, mollies cannot be kept with either platys or guppies as the former simply out compete the latter for food. The mollies attain the full size in the six month period while the guppies are so underdeveloped in the same pond that the sexes are barely distinguishable!

Another problem relating to stocking fishes into ponds is the case of the Tanganyikan cichlids. Because their growth is slow in aquaria they have been stocked into ponds in an attempt to speed up their growth. Firstly, their growth did not increase noticeably and secondly, when it came to harvesting the dam, only *Lamprologus brichardi* was found in appreciable numbers. Perhaps this relates to this species being more pelagic than the *Julidochromis*, *Lamprologus* and other species stocked in the pond, but such limitations are only discovered by trial and error.

Producing the fry

As mentioned, the major emphasis is on Malawi cichlids. Mbuna brood stock are kept in tunnels in 2 000 litres concrete tanks whereas the open water species, including *H. venustus*, *C. moorii* and South American *Geophagus*, are maintained in 100 000 litre ponds. All species are maintained at a male:female ratio of about 1:5. Every three weeks the mouth brooding females are stripped of their eggs and fry which are then incubated artificially in glass aquaria and saturation fed on brine shrimp nauplii and high quality flakes. The fry take 3 weeks to attain a length of 1cm, when they are moved outdoors to a fertilised pond where they take a further 6 weeks to reach a market size of 3-4cm.

Livebearer brood stock are kept in unfiltered 2 000 litre tanks constructed from poles and lined with plastic. Brood stock are maintained at a ratio of 1 male:4 females and a density of around 1 fish per 40 litres. A bunch of netting in one corner provides a sanctuary for newborn fry, which are harvested daily and moved to a fertilised pond. All the fry from a calendar month are placed in the same pond and allowed 6 months of growing before being harvested and sold as sub-adults.

Several species are stocked into the ponds in early spring and the fry harvested as required throughout spring and autumn before the adults are moved indoors for winter. These species include the fire mouth, red devil, synspilum and *Haplochromis obliquidens*. Other species, including rosy barbs, glassfish, texas cichlids and African jewels, survive the winter in uncovered ponds.

Of the hatchery bred species only angels and oscars are stocked into ponds. All three of these species do well in the ponds, although oscars are prone to white spot disease and need to be moved indoors well before the onset of winter.

One little fishy went to market

Approximately 85% of the fish produced on Valley Fish Farm are sold within South Africa. Although the aquarium hobby is in a fairly juvenile state compared to Europe and North America there is an increasing demand for the Rift Valley cichlids. It is expected that this section of the market will continue to grow as will the international demand. This farm is gearing itself up to take advantage of that growth.

!!!STOP PRESS!!!

TETRA'S UK WEB SITE

Tetra have just announced their entry into the world of the Web. Their new web site is advertised as a "...comprehensive guide to every aspect of water features and fish care..."

The Tetra website does not just provide information on Tetra products, it also gives valuable information to the beginner and the expert as well as giving information and the chance to join TetraClub and gain valuable discounts from retailers in the TetraClub Discount Scheme (also listed on the Tetra website).

I have not had time yet to test out this web site, but you can find Tetra on **www.tetra-fish.co.uk.**

GET THE MAX

Fish nutrition has become a hot topic over recent years with all of the major fish food manufacturers undertaking extensive research both to decide what you the consumer desires from a fish food and how best to formulate foods to meet these requirements.

I'm sure it comes as no surprise to you to find that the market research findings revealed that there are three main features hobbyists seek from a quality fish food:

1) It must keep fish healthy
2) It should help to enhance their coloration
3) It should not encourage algae blooms in the aquarium

Nutritional research associated with commercial aqua-culture has for a number of years been working towards these same goals and the latest work has been aimed at producing a highly digestible energy fish food that is low polluting and contains high levels of natural pigment rich ingredients. To accomplish this, fishery scientists discovered that modern fish food formulations needed to be prepared from the highest grade of fish protein and other raw materials and be fortified with selected other ingredients.

Some of the cheaper grades of fish food contain high levels of bulking material such as fish bones and scales which can be polluting as the roughage creates a high, what is called, ash level. Ash in a fish food represents any non-digestible substances that remain after the fish has eaten and digested the food.

Large amounts of phosphorus and other minerals are often present in high ash producing foods, which pollute the water and of course are no benefit to the fish.

Krill and Spirulina were found to be the best pigment rich ingredients with which to fortify fish foods and these, together with vitamin supplements and certain extracted amino acids, not only improved the nutritional level of the food but also aid its digestibility.

When Rolf C Hagen decided to reformulate their Nutrafin range of foods they were determined to take all of this new research on board. Nutrafin fish foods have always been a popular choice but the goal Hagen set themselves was to create a new range of foods that are so advanced and outstanding that they would fall into a brand new category.

Nutrafin Max is the name they gave to these new super foods, which would be packed with the highest quality ingredients and be guaranteed to meet all of the requirements necessary to be labelled the most outstanding fish food.

The scientists at the Hagen laboratories in Canada first looked at the many different sorts of ornamental fish kept by the aquarist today. Using the latest scientific breakthroughs they researched the needs of coldwater, tropical freshwater and marine fishes and came up with all of the nutrients they need for healthy development and growth.

To meet the criteria of a highly digestible nutritious food that is low polluting, the Hagen boffins followed the lead coming from commercial aquaculture and chose pre-digested Plankton as the major ingredient in their formulations. Nutrafin Max is the first aquarium fish food to be formulated in this way using a food that contains only totally digestible nutrients and provides exceptionally biological value. High biological value or what is sometimes referred to as the high digestible energy in a food relates to the energy the fish can gain from the proteins, carbohydrates and lipids it contains.

Using P.D.P. as the main ingredient also overcame the problems of high ash content found in other foods and ensured levels of Phosphorus and other polluting ingredients are exceptionally low.

Phosphorus is a dietary requirement of fish but requirements are very low. A phosphorus content of more than 0.9% in a food is considered excessive and can cause algae blooms.

To further improve the formulation of the Nutrafin Max range, other ingredients were added to give a balanced nutritional profile to the foods. Methionine, an essential amino acid for digestion and several other vital functions, was added together with high quality stabilised vitamins such as Vitamin C, D, A and E, etc. Colour enhancers based upon natural ingredients were also added and a palatability agent to act as a fish attractant.

So there we have it, a brand new range of outstanding foods which are highly nutritious, increase growth and survival rates and are rich in natural pigment levels to enhance fish colours. What's more your fish will also find it tastes good so they will be eager to feed and less food will be left uneaten to foul your tank.

Hagen are so pleased with Nutrafin Max that they would like to give FishWorld Magazine readers a chance to be the first to try this great new range of premium fish foods. We have 25 tubs of Nutrafin Max Staple Diet to give away. Just write to us at the address below stating your choice - be it coldwater, tropical or marine and the first 25 readers drawn out of the hat will receive a bumper pack of their chosen Nutrafin Max food.

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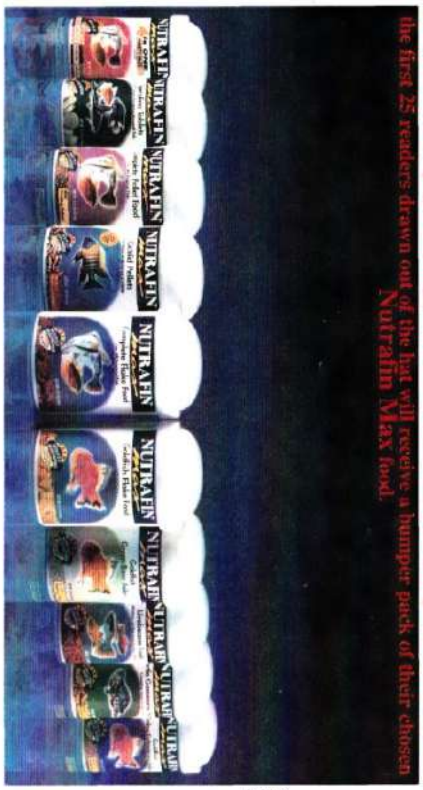
Castleford
WF10 5QH

For more information about Nutrafin Max or any other Hagen products contact us on 01977 556622



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HARS

BEHIND THE SCENES AT HAGEN

With Nutrafin Max fresh on the shelves at your local retailer together with a whole new complimentary range of Total Health products what better time is there to focus on what goes on at Hagen, behind the scenes, before these products even reach your store.

The Hagen Aquatic Research Station (HARS) was founded in May 1996 to research all facets of fishkeeping including the development of new products, the testing and refining of older products and to explore all areas that have potential benefit to aquarists and their fish.

The HARS mandate is to make fish keeping easier and more enjoyable to everyone whilst ensuring a safe aquatic environment for fish. This translates into the added responsibility, beyond research, of providing help and support to the hobbyist and retailer alike.

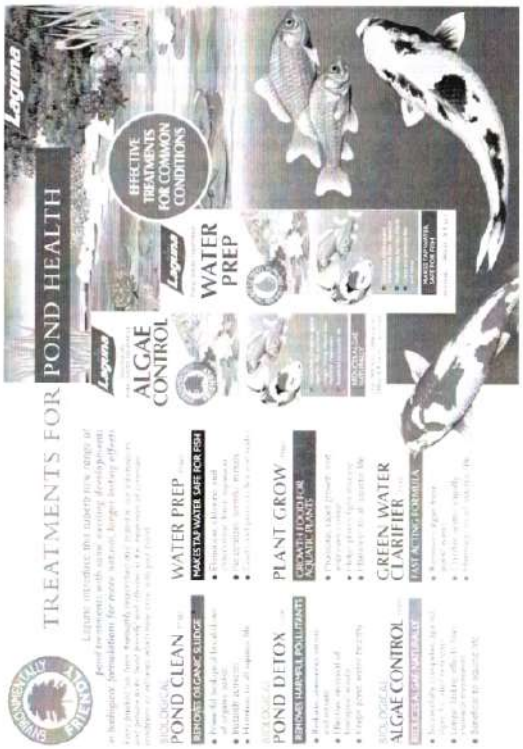
One of the major thrusts in HARS research is to provide a safer and simpler way to keep fish. Proper stocking levels and maintenance protocols need to be examined in detail. Quantitative results as well as aesthetic benefits of live plants in the aquarium are also explored. The interaction of the bacterial level with visible inhabitants is another area of research. By understanding these interactions and ensuring accurate information is released to aquarists the chances of success in the hobby increases.

The Hagen Liquid Products Division was established in 1993. It is a state-of-the-art manufacturing and packaging plant, which employs high-speed automated equipment in a fully controlled environment. The entire plant is designed with quality control as a priority. Products such as Cycle, Aqua Plus and Waste Control, Plant Gro and Laguna Pond Water Conditions are manufactured and packaged here in a wide variety of bottles and other containers.

The Hagen Aqua Lab at the University of Guelph is an independent, state-of-the-art aquatic research and teaching facility that opens its doors for students to undertake research on a vast variety of aquatic organisms. The environmentally controlled rooms in the Aqualab can simulate habitats as diverse as the Arctic Ocean and tropical rain forest pools. The Aqualab includes holding and culture facilities for aquatic organisms, controlled environments permitting precise control of temperature, photoperiod and salinity as well as facilities providing an outstanding educational experience for students with interests in the aquatic sciences.

IET - Aquaresearch Ltd was founded in 1984 on the principle that a key to environmental protection is to regard pollution as a misplaced resource. With this in mind it is possible to use natural processes to abate pollution by ecologically sound techniques.

Extensive research surrounding the Hagen biological water treatments has been undertaken by this independent research organisation, who also work extensively in the areas of domestic, industrial and municipal waste water treatment, agriculture, aquaculture and lake restoration.



DISCUS HEALTH

by Dr David Pool, Tetra Information Centre

Discus, in common with all of the fish we keep in our aquaria, are subject to a range of different ailments. In the past our knowledge of these diseases and why they occurred was limited, with the result that many discus died (and they were consequently regarded as difficult fish to keep). In recent years, however, our understanding of the needs of the discus has increased greatly and losses are now the exception rather than the rule.

HOW DO DISCUS BECOME DISEASED?

In this article I would like to examine the main diseases affecting discus, why they occur and how they can be treated. Before doing so it is important to point out that all of the discus that are kept, and for that matter all of those that are for sale, are diseased. That is they are all infected by at least one, and often several, species of parasites. These parasites are a natural part of the environment of the discus.

If the discus is in good condition generally, its immune system (the bodies natural means of countering disease) will be active and capable of controlling the infection, ensuring that the parasites are only present in very small numbers. Exactly the same is true in humans. Each of us are infected by a number of different species of disease organisms, such as cold viruses, flu viruses, and perhaps something considerably more serious. But if we are otherwise healthy, our immune system will naturally control these diseases and we will feel healthy. If the discus becomes unhealthy for any reason, for example due to poor water quality, unsuitable nutrition, stress, etc., the immune system will be suppressed, allowing the existing parasites to increase in numbers and cause problems.

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

FACTORS CAUSING POOR HEALTH IN DISCUS

Discus, as with most other fish are sensitive to a variety of different factors, which could weaken them and eventually result in a disease outbreak. The following are perhaps the most important:

1. Water Quality

Discus are particularly sensitive to poor water conditions and will fail to thrive if not provided with a suitable aquatic environment. Raised pollutant levels (nitrite and nitrate) and sudden changes or unsuitable values of the pH and hardness are particularly important.

Raised nitrite levels (> 0.25mg/l) can be directly toxic to the discus, leading to irritation of the gill and skin membranes, and reducing the ability of the blood to transport oxygen. At lower concentrations the fish will be weakened allowing parasite numbers to increase. Nitrates are unlikely to be directly toxic to the discus, unless the concentration is greater than 50mg/l. Again at lower levels the fish will be weakened leading to disease problems.

Discus are traditionally regarded as soft, acid water species as these are the conditions in the Amazon from where they originate. However, now most discus are tank bred specimens and in some cases have been acclimated to harder more alkaline water. It is worth checking on this fact when purchasing new fish, as a sudden change in the water quality can have disastrous effects. The same is true when undertaking a partial water change - make sure that any adjustments are undertaken outside the aquarium so that the water entering the aquarium is exactly the same as that already present.

2. Nutrition

In common with all fish, discus require a nutritionally balanced diet. In the wild this is obtained in the form of many types of live foods, eg. insect larvae, shrimps, etc. In the aquarium many discus are also fed on fresh or live foods, however here the choice is usually limited to beef heart, bloodworms, daphnia and brine shrimp. Whilst all are readily accepted by the discus they do not provide all of the necessary nutrients. Therefore over a prolonged period of time this leads to nutritional deficiencies which affect spawning success, colouration, growth, etc. In the past flaked food or additives were often added to the foods in order to prevent such problems. Fortunately there are now a number of commercially available foods which are ideal for discus. One food which has recently been launched is Tetra Prima - a slow sinking granular food which has been widely used by discus keepers in Germany, Japan and the USA.

3. Territoriality

Discus are cichlids and as such are territorial to a certain extent. In any group of discus a 'pecking order' will soon be established in which the weakest individual will be picked on by all of the other individuals. If only 2 or 3 discus are kept in the same aquarium the weakest individual may be constantly bullied, resulting in it being prevented from feeding and becoming greatly stressed (often indicated by the

appearance of dark vertical bars on the side of the fish). This fish will be particulary susceptible to disease attack and will often succumb if preventative measures are not taken. In larger groups the aggressive behaviour is distributed between a greater number of fish with the result that no one individual is overly affected.

4. Surroundings

The surroundings in which the discus are kept can affect their overall health and therefore their susceptibility to disease infection. They are, for example, very susceptible to bright conditions and will become stressed and very nervous if not provided with dim lighting or areas of shade. A strong water flow in the aquarium can also result in problems.

DISEASES OF DISCUS

The actual disease which affect discus are in most cases the same as those which affect other tropical freshwater fish. The following are probably the most important:

1. Hole in the Head disease

Hole in the head disease is widely regarded as the discus disease as it frequently occurs in these fish, often with disastrous consequences. In fact the disease can infect a range of different fish species such as other cichlids (eg. angelfish and oscars) and gouramis.

What is it?

Hole in the head disease is caused by a flagellated protozoan parasite called Hexamita. This parasite is in the same family as Octomitus and Spironucleus and it is often referred to by these names in older literature. Hexamita is a very small parasite (approximately the same size as a blood cell) and can only be detected in the host tissue using a microscope.

Signs of infection

Hexamita may exist as a low level infection in the intestine of most discus and possibly other species, without doing the fish any harm. Under certain circumstances the parasite numbers may increase rapidly with adverse effects on the health of the fish. Fish suffering from heavy infestations of Hexamita in the intestine often go off their food, become listless and hollow bellied, with yellow mucus in the intestine and pale 'stringy' faeces. In discus the infection is thought to pass from the intestine into the internal organs. Often the end result of such infestations is the development of the typical lesions in the head region, at the base of the fins and near the lateral line, which often have a small string of mucus arising from the centre.

Treatment

In some cases slowly raising the water temperature to 30°C for 5 days has been effective in controlling mild Hexamita infections. The increased water temperature stimulates the fishes immune system as well as weakening the parasite. In more severe cases chemical treatment is necessary. Two chemicals often used to control Hexamita infections are Emtryl (Dimetridazole) and Flagyl (Metronidazole).

Emtryl should be used at a concentration of 5mg/l in the water of the tank containing the infected fish. This dose should be given 3 times at weekly intervals, with a partial water change between each treatment.

Flagyl is probably used more widely than Emtryl. Sufficient Flagyl should be added to an isolation aquarium to give a final concentration of 7mg/l. One treatment is usually sufficient, although it may be repeated every other day for a maximum of three treatments. Flagyl can also be incorporated into the feed and fed for 7 days. This offers an ideal method of controlling the disease providing the fish are still feeding, as in this way the remedy gets inside the fish where the disease occurs. An excellent medicated food for discus can be made in the following way. Firstly 2 Flagyl tablets should be ground to a powder and mixed with 6 crushed Tetra FD Tips tablets. A small quantity of water is then added to form a thick paste and this paste is spread on the curved surface of 10 FD Tips tablets. After being left to dry overnight the tablets may be fed to the discus at the rate of 1 tablet per 2 adults or 4 small fish each day. The above tablets are ideal for this purpose as they can be stuck to the aquarium glass and are therefore more readily accepted by the discus.

Emtryl (Dimetridazole) and Flagyl (Metronidazole) are only available on a veterinary prescription in the British Isles, and your local vet should be able to advise you on the calculation of the correct dose levels. Although both of the aforementioned drugs have been used successfully and safely on many occasions, it is important to realise that neither is licensed specifically for use with fish, and hence any aquarist using them do so at their own risk. There are a small number of commercially available preparations which are designed to be used to control Hexamita.

2. Gill flukes

What are they?

Dactylogyrus, the most common genus of gill fluke is a small, pale coloured, worm like parasite which is usually 0.2 to 0.5mm in length. The adult parasite attaches to the gill filaments of the fish using the hooks which are located at the front end of the body. A sucker at the rear of the body is used in conjunction with the hooks to allow the fluke to move across the gills in a leech-like fashion. The flukes feed on the secondary gill filaments, thereby reducing the area available to take oxygen out of the water. Gill flukes are hermaphrodites (both male and female) therefore only one individual on the discus can reproduce and cause problems. This reproduction is by means of eggs which either remain attached to the gills (allowing the young to infect the same fish) or drop off and the larvae searches for a new host. The larvae must find a new host within 4 - 6 hours or they will perish. At the temperatures usually found in the discus aquarium Dactylogyrus can complete its life cycle within 2 days.

Signs of disease

Severe infestations may cause damage to the gills resulting in the fish having difficulty in obtaining sufficient oxygen. The result of this is that infected fish will often accumulate around filter inflows, gasp at the water surface or show rapid gill movements. Excess mucus is often produced by the fish as a reaction to the flukes and this will further exaggerate the problem of oxygen uptake. The flukes may cause severe irritation to the discus which results in the fish rubbing, flexing the gill covers and showing short, sharp swimming movements followed by periods of laying still on the aquarium bottom.

Treatment

Good quality commercially available remedies are by far the best means of controlling gill fluke infections. In most cases they will be effective at controlling the problem within 5 - 7 days. Before treating a gill fluke infection it is advisable to check the water quality, and in particular the nitrite and nitrate concentrations as raised levels could result in similar signs.

3. Intestinal disorders

What are they?

Intestinal disorders is a term covering a multitude of sins. Possible causes of such disorders include the larger intestinal parasites (eg nematodes and tapeworms), Hexamita infections and nutritional problems.

Signs of infection

Intestinal infections can manifest themselves in a variety of ways. These include the production of clear stringy mucus, emaciation, localised swelling or poor growth. In the majority of cases further diagnosis of the problem is only possible by conducting

a post mortem. Unfortunately this is not always possible, or feasible.

Treatment

Treatment of an intestinal disorder depends largely on the nature of the problem. Nutritional deficiencies and Hexamita infections have already been covered in this article. Intestinal worms may be controlled using commercially available anthelmintics, such as those used for dogs and cats. Such chemicals are only effective if they get inside the intestine of the discus. The best way of doing this is to use a medicated food prepared as described in the section on Hole in the Head disease. Perhaps the best remedy for tapeworm infections is a drug called Praziquantel (Bayer) which is only available on a veterinary prescription. This remedy should be used at a concentration of 20 - 50 mg per kg of fish body weight at 2-day intervals for 3 treatments. Round worms (= nematodes) can be controlled using Piperazine citrate which should be used at the rate of 25 mg per FD Tips Tablet. This treatment should be used twice with a 10 - 14 day interval between each.

4. Sliminess of the skin

What is it?

Sliminess of the skin is not caused by any particular parasite, but is a term to describe a build-up of mucus on the body of the discus. The excess mucus production results in the formation of pale areas on the body, and are caused by irritation of the skin and/ or gill membranes. When irritated the mucus secreting cells release copious quantities of mucus in order to protect the skin and gills. This irritation may be caused by a number of factors including poor water quality, bad handling or parasitic attack.

Bad handling is usually easy to diagnose as it occurs following transportation or capture of the fish and only affects a small number of individuals. Water quality problems account for the majority of 'sliminess' problems. In most cases the majority of the fish within a certain aquarium will be affected. The sliminess will also tend to be distributed over all of the body, although it may be denser in certain areas such as around the gills. Raised pollutant levels (eg nitrite, nitrate, chlorine, insecticides, etc) and unsuitable or a sudden change in the pH value are the usual causes. Parasitic attack will usually result in the build-up of mucus being restricted to certain areas of the body. Infections by protozoans such as Trichodina, Costia or Chilodonella and skin flukes will all cause a build-up of mucus on the body. Gill parasites such as protozoans and gill flukes will generally cause a build-up of mucus around the gills.

If needed an accurate diagnosis can be achieved by examining a skin scrape under a microscope. To do this a small quantity of mucus should be taken from an infected area using a cotton wool bud or blunt knife and placed in a drop of water on a microscope slide. This should be examined at a magnification of x50 - x100. If parasites are responsible they will generally be present in large numbers and be active. No parasites present suggests a water quality problem or bad handling.

Signs of infection

Sliminess of the skin is usually very easy to diagnose by means of the build-up of mucus on the body of the fish. Other effects include rubbing against underwater objects and shimmying (swimming on the spot). The excess mucus production can also affect the breathing of the fish resulting in them gasping at the water surface.

Treatment

Early treatment of sliminess of the skin is important as it can be lethal to the discus, either directly or due to a secondary bacterial infection. The method of control depends on the cause of the problem.

1. Water quality. Initially a large water change should be undertaken to dilute any pollutants. The replacement water should be the same temperature as that in the aquarium and should be treated with a tap water conditioner such as Tetra AquaSafe in order to remove any potentially dangerous chlorine and chloramine from the water which would further irritate the sensitised skin and gill membranes. Water quality tests should also be undertaken in order to determine what caused the problem and the cause corrected.

2. Physical damage. The affected fish should be isolated and treated with a good quality external parasite/bacteria treatment in order to prevent any secondary infections. In most cases providing good food and good water quality will result in the discus recovering full health.

3. Parasites. The discus should be treated using a reliable external parasite treatment which will control protozoans and flukes. Increasing the water temperature by 2 - 3°C will also help by making the parasites more susceptible.

The diseases discussed in this article are those most commonly occurring on or in discus, although other species of parasites undoubtably infect them from time to time. Further information on all of these diseases is available in ADI 49 "Water chemistry and fish diseases" which is available from Tetra (Price £1.85 + 20p P&P) at:

Tetra,
Mitchell House,
Southampton Road,
Eastleigh,
Hants
SO50 9XD.

TROUBLESOME TIGERS

by Dr David Pool, Tetra

The tiger barb (Barbus tetrazona) is one of the more popular tropical fish, despite its reputation as being a troublesome character in the community aquarium. This reputation is largely unfounded, and due mainly to our ignorance with regards to the tiger barb's requirements.

Taxonomy

Before looking at the care, maintenance and breeding of this fascinating fish, it is worth examining exactly what it is and what it is related to.

The tiger barb is a member of the genus Barbus. This genus is a large and widespread grouping of fish ranging from the large barbel (Barbus barbus) a common fish in many UK rivers to the tiny cherry barb (Barbus titteya) from Sri Lanka.

The genus Barbus includes many species which are not believed to be directly related if you examine their evolutionary history. Because of this a number of attempts have been made to break down the genus into smaller groups. One suggestion was that it could be divided on the basis of the number of barbels into the genus Puntius (with no barbels), Capoeta (with 2 barbels) and Barbodes (with 4 barbels). However, further examination showed this was not an adequate solution. The tiger barb, having no barbels was placed in the genus Puntius according to this classification and the name Puntius tetrazona is seen in some books on fishkeeping.

Origins

The tiger barb originates from Indonesia, Borneo and Sumatra, where it is found in slow flowing rivers and streams. Fish that are available from aquatic shops are all now bred in aquaria in fish farms in South East Asia.

Selected breeding of the tiger barb has resulted in several colour varieties, of which the most popular are the green and albino tiger barbs. The albino tiger barbs are very popular, but care should be taken when selecting them to avoid individuals without a gill cover. This genetic deformity occurs in a small number of fry in most spawnings of this variety.

Care

Looking after tiger barbs in your aquarium couldn't be more straightforward. They are hardy, will tolerate a range of water conditions and readily accept cried foods.

A temperature of 75-82°F (24-28°C) is ideal for the tiger barbs, as is a pH of 6.5-8.0, GH of 2-10°dH and a KH of 1-6°dH. They are sensitive to elevated levels of pollutants, therefore a good filter and regular partial water changes are advisable. Some water movement is also advisable, both to ensure there is plenty of oxygen in the tank, and because the tiger barbs enjoy swimming in and out of the water current.

Tiger barbs can live for up to 4-5 years, which is longer than they live in the wild. As they age they start to lose their colours, and can become more solitary.

Tank Decor

They are an active species of fish, therefore provide some areas of open water in the aquarium. The ideal is a mixture of open areas and some densely planted zones. These planted areas will be used during spawning, but also allow the females to escape from the males when necessary.

An aquarium of at least 24 inches (30cm) in length, and preferably larger is advisable. Although tiger barbs are not large, growing to around 3" (7cm) they should be kept in groups of at least 4

individuals. In the wild they live in much larger shoals and are constantly searching for food, chasing or displaying to each other. This behaviour will be reproduced in the aquarium if the fish are kept in small groups. However, if kept individually or in pairs, they can become boisterous and indulge in chasing and nipping the fins of the other fish. It is just this behaviour, resulting from them being kept in too small numbers, that has given them their bad reputation as "bullies" and "fin nippers".

Within the shoal, the tiger barbs will quickly establish a "pecking" order. Usually the largest fish is at the top of this order, and the smallest at the bottom. Once established, the pecking order prevents anything more serious than the occasional skirmish, however, a period of chasing and displaying will occur whenever new tiger barbs are added.

Feeding

Tiger barbs are omnivorous feeders, meaning that they consume a mixture of plant and animal material. In the wild the majority of their diet is made up of insect larvae, fry and aquatic invertebrates. A good quality flaked or granular food (such as TetraMin or Tetra Prima) is ideal for tiger barbs in the aquarium. This can be supplemented with colour enhancing foods and freeze dried foods on a more occasional basis.

Tiger barbs are active fish generally, but are particularly so at feeding time, therefore they should be fed away from more timid species - or the food should be spread across the surface so that they all have a chance.

Breeding

Given suitable conditions tiger barbs are very easy to breed, and will often do so in a community aquarium. Under such conditions, most of the eggs will be consumed, therefore it is much better to separate the parents into a suitable breeding aquarium.

When the fish are mature distinguishing males and females is relatively simple. The males tend to be smaller, thinner and more brightly coloured - particularly their fins. The female is much fatter, particularly when full of eggs and ready to spawn.

One male to one female, or better still two males to each female, will generally result in a successful spawning. These fish should be conditioned on good quality foods for several days before being introduced into the breeding tank. This should comprise of a 18-24 inch (45-60cm) long tank decorated with bunches of fine leaved plants. If added in the evening, the parents will often start their courtship display and chasing the following morning at dawn. Up to 200 eggs are released which are trapped in the plants. After they have finished spawning the parents will start to devour the eggs, so they should be removed.

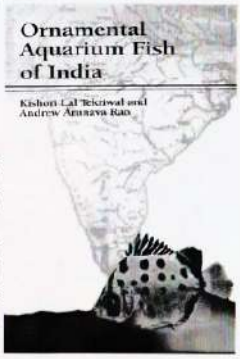
If spawning does not occur within 3-4 days, separating the males and females and re-introducing them 7 days later will often work.

The fry hatch after 2-3 days and after a further 1-2 days are free swimming. At this stage they can be offered newly hatched brine shrimp and powdered foods such as Tetra Baby Fish Food for Egglayers. The fry require 4-5 feeds per day, and need to be fed in excess to ensure each one gets enough food. Regular partial water changes are therefore essential.

Tiger barbs are a good fish to add to a community aquarium, particularly a newly set up one. Their bright colours, active nature and hardiness will ensure that they become one of the centres of attention within the tank. But remember the warning about numbers to keep - at least 4 if you don't want them to live up to their troublesome reputation.

ORNAMENTAL AQUARIUM FISH OF INDIA
Reviewed by Roger Crew

Kishori Lal Tekriwal and Andrew Arunava Rao
TFH Kingdom Books
ISBN 185279117-9



The forward is by John Dawes, who reminds us that: ***"Whilst not a definitive treatise on Indian fish, this book is unique in bringing together as it does colour photographs of 250 species involving 119 genera across 53 families."***

The authors have attempted to provide the reader with details of the aquarium characteristics and requirements of these fish as well as scientific and biological details. This book therefore combines the essentials necessary to satisfy both the curiosity of the fish hobbyist and the practical needs for aquarium care so necessary for the hobbyist.

When I first saw this book earlier this year at "AQUARAMA" in Singapore, my first impression – as an aquatic hobbyist who I confess has a more than usual interest in the fish of the Indian Continent – was that this was a book which fell far short of that implied by its title. Covering as it does only a comparative few of the species to be found in India. Having had the opportunity to fully digest the contents, my opinion is changed somewhat.

As the fish of India, with some prominent exceptions, have not been commonly available within the UK hobby; the introductory chapters detailing the topographic and Political variation across the continent together with a synopsis of the aquarium trade are of vital importance to the newcomer to these fish.

Chapter two sets out quite an in-depth scientific description of the taxonomy of the Indian fish. However, the book deals only with those fish the authors consider "aquarium worthy" – a unique term used to excuse the omission of huge amounts of data. Those deemed "aquarium worthy" are however dealt with well, a short chapter being included on each genus.

By the time chapter three, misleadingly called "Atlas of Ornamental Indian Fishes", is reached 60 pages have past. Seventy-three further pages illustrate the fish, three to a page with very little text and using those frustrating "International" symbols as a code. I don't think I am alone in detesting these systems which require the reader to constantly turn back to the key in order to clarify the meaning hidden behind some obscure symbol.

I do appreciate that adherence to a format which suited me would result in a much more expensive book! At around £20 this volume still represents good value and I expect to make very full use of my copy and look further to seeing future extensions of the work.

FISH SHAPES

The shape of a fish helps us to understand the type of natural habitat that it comes from in the wild.

CYLINDER-SHAPED BODY - denotes a fish from fast-flowing waters. It will probably be an upper- to mid-water inhabitant. An example is the Zebra Danio (Brachydanio rerio).

FLAT-BOTTOMED BODY - classically associated wtih bottom-dwellers. Example: Peppered Cory (Corydoras paleatus).

FLAT-TOPPED BODY - these fish swim and feed from the surface or just below it. Characterised by Steel-blue Aphyosemion (Aphyosemion gardneri).

DISC-SHAPED BODY - this type of fish often lives in reeds or similar aquatic plants. It is best suited to slow-moving waters. Its body is usually slender. Example: Discus (Symphysodon discus).

TRIANGULAR-SHAPED BODY - usually denotes a fish that can launch itself to skim over the surface of the water. The triangle-shape is partly due to the heavily muscled chest. The body is very slim to aid its 'flight'. A good example is the Hatchet Fish (Carnegiella strigata).

FEEDING HABITS

INFERIOR MOUTH - typified by the Corydoras catfish. The mouth is located towards the bottom of the head and denotes a bottom-feeder.

SUPERIOR MOUTH - the mouth is upturned and denotes top-feeders. This type of mouth is found in Guppies (Poecilia reticulata).

TERMINAL MOUTH - indicates the fish inhabits and feeds from the midwater regions. Aphyosemion gardneri exhibit this type of mouth.

STOCKING YOUR TANK

When stocking your tank it is advantageous to select fish from more than one of the above two sets of categories so that your tank shows movement in all areas.

THE A-Z OF FISHKEEPING

AERATION - most tanks require some kind of aeration - even if you have the population levels right - to provide the dissolved oxygen the fish need to survive. Aeration can be added by using an electrical air pump. The pumps can be regulated to give the preferred level of aeration. The compressed air generated by the pump is introduced into the tank via a small gauge tube and an air stone. A good aeration system has two benefits: first, the air helps to provide circulation into the tank so that it all becomes exposed to the air at the surface at one time or another, which allows the water to absorb more oxygen and for the carbon dioxide to be removed; secondly, mixing the water helps to maintain a constant water temperature throughout the whole tank.

AIR STONE - used to diffuse artificially introduced oxygen into the water. These 'stones' are available in a wide variety of shapes and sizes and are made of a hard, porous material which allows oxygen to pass through it under pressure.

ALGAE - if algae grows quickly it may mean there is too much light or that the nitrate (pollutant) levels are too high. High levels of light will also produce a lot of green algae. Conversely, brown algae indicates that you do not have adequate levels of light. Algae is usually introduced with plants or ornaments. It is, therefore, essential that new plants and/or equipment are thoroughly cleaned to reduce this likelihood.

ANABANTIDS/ANABANTIDAE - labyrinthine fish which originate from Asia and Africa and who possess a respiratory organ called the labyrinth organ. This organ is situated in the gill (branchial) cavity on both sides of the head except in baby fish (fry) who do not develop one until they are several weeks old. It is rich in small blood vessels and is made up of folded soft tissue. Labyrinthine fish travel to the surface regularly to take in fresh air which is passed through the labyrinth organ where the oxygen is absorbed into the blood stream. The labyrinth organs ensure that anabantids are able to live in water that is deficient in oxygen. This is often the case in the tropics as high temperature drives oxygen from the water.

ARTEMIA - Artemia salina (Brine Shrimp) lives in brackish (salty) waters and is one of the most popular foods aquarists use to raise young fish. It is a small crustacean and the dried eggs when put in salt water with aeration will hatch in approximately 24 hours. The baby Brine Shrimp can be collected by switching off the aeration, waiting a few moments and shining a torch to one side. A pink cloud will migrate towards the light and can be collected with a pipette or small syringe. The nauplii can then be fed to the baby fish. Although it is a fairly difficult task, the nauplii can be grown on to adult Brine Shrimp (1cm). These can then be fed to larger fish

TIGER BARB

by Dr. David Poole, Tetra

Scientific name:	Barbus tetrazona
Origin:	Borneo, Indonesia & Sumatra
Size:	3 inches (7cm)
Water requirements:	Very tolerant of a range of pH, hardness and temperature values. Avoid raised levels of pollutants.
Feeding:	A good quality flaked or granular feed as a regular diet. Occasional feeds with colour enhancing foods.
Sexual differences:	Males are smaller, thinner and more brightly coloured.
Breeding:	Relatively easy with 1 or 2 males to each female. Scatter up to 200 eggs amongst plants. Fry hatch after 2-3 days and are free swimming 1 day later.

"Merlin's Water Garden"

Federation of British Aquatic Societies

Designed by Graham Robb

Bronze Medal

HAMPTON COURT

"A Taste of Japan"

From Tetra

Designed by Terry Hill

Bronze Medal

1999

"Still Water & Dreams"

From Anglo Aquarium Plant Co

Designed by Jane Sweetster

George Cooke Memorial Award

(Most original and innovative garden)

Silver-Gilt Medal

FISHKEEPING THROUGH THE MILLENNIUM EXHIBITION

MAY 1999

by Kathy Jinkings

Although fishkeeping can be practised as a solitary hobby, there is far more fun to be derived from sharing information and successes, and having people to commiserate and offer advice on failures. As everyone who is involved in fish clubs and societies, whether on a local or national level, will know, membership of hobbyist societies is struggling to compete with pursuits such as television, computer games, and an ever-increasing number of hours spent at work. As we move into the next millennium, action is needed on many fronts if the hobby as we know it is to continue.

The "Fishkeeping Through the Millennium" exhibition, which took place at the Blue Planet Aquarium on the weekend of the 22nd and 23rd May, 1999 proved to be an excellent event from many aspects, and such events can only be beneficial to fishkeeping. The choice of venue was excellent; the exhibition was guaranteed a large number of visitors with at least a passing interest in fish and learning more about them, an appetite which could only be whetted by the Blue Planet displays. A wide variety of fish, along with associated animals such as caimans, frogs and other aquatic or semi-aquatic creatures, illustrated the fantastic diversity of life both in the oceans and in fresh waters. The 71 metre tunnel which leads

through the huge Caribbean reef tank is an unforgettable experience, with the visitors having the choice of either being transported effortlessly through the display on a conveyor belt or hopping off to give a particular area a closer inspection. No matter how many times you go through the tunnel, the display never becomes boring or fails to offer some new sight as the fish go about their lives seemingly unaffected by the humans passing through their midst. The sharks and rays catch the eye immediately, but a host of other fish inhabit the tank, both solitary species and large shoals. I spent an entertaining half hour watching a particularly endearing little puffer, who was in two minds about whether to venture past a resting sand shark to some particularly interesting (to a puffer fish) patch of sand. In spite of the shark's total indifference, the puffer was seized by deep indecision, and tried several angles of approach, each time only to suffer a flash of nerves, inflate and dart away to rethink. Although the Caribbean reef is the largest and most impressive, all the individually filtered tanks contain equally fascinating fish. A member of staff is usually on hand to answer questions from the public, in addition to the organised displays when the audience is encouraged to touch a fish, or to ask questions as divers hand feed the fish.

Within this setting the millennium exhibition integrated perfectly; rather than having the stands grouped in a single area, which might easily have been bypassed, stands were set up throughout the aquarium. A wide variety of exhibitors were present; the 'big names' such as Tetra and Interpet set up stands, including a display from the Tetra painting competition for young fishkeepers. All Clear water purifiers were there with explanations and advice for keepers of all types of fish, along with a curious tap which appeared to pour perpetually without a source; this kept many youngsters in a state of fascination whilst their parents were able to discuss more serious concerns.

Local and national fish clubs displayed tanks of fish and dispensed advice to anyone in need of it. Hopefully many of the people who went home armed with advice ranging from how to start up a tank to more complex queries will be convinced of the benefits of the free access to information that joining a fish club represents. Darwen Aquarists' club displayed beautiful aquascapes, a form of aquaria that often excites the most interest from the public; the idea of having what appears to be a section of riverbank transplanted into their homes often fires the imagination of people who have passed by other aquaria without

comment. The Northern Area Catfish Group (recently renamed the Catfish Study Group) exhibited a beautiful set of photographs, which should put paid to any idea that catfish are brown and boring in the minds of anyone who saw them. Unfortunately many other national specialist groups were absent, which is disappointing. We can only hope that on future occasions they will participate, as an exhibition in such a venue is an ideal opportunity not only to preach to the converted, as is the case at many exhibitions, but to convince the general public that fishkeeping is an accessible and interesting hobby.

In addition to the stands and the main aquarium displays, other events provided even more entertainment to the visitors. Whilst not everyone approves of fish shows, such occasions indisputably offer an opportunity to see not only a wide range of species of fish, but to see representatives of those species which are glowing examples of the best of their kind. Many people who have only seen juveniles and fish in the unavoidably stressful condition of aquatic stores are amazed by the size and beauty of the fish that can be seen on these occasions. The tropical and coldwater fish show on the Sunday was notable not only for the high quality of the entrants, but for the fact that it represented a collaboration between the Federation of British Aquatic Societies and the Federation of Northern Aquarium Societies. The show was judged to FNAS rules by a team equally composed of representatives from both bodies. This may seem a small thing, but such a collaboration bodes well for the future and the ability of the aquarium hobby to maintain a cohesive strength to support existing hobbyists and encourage new ones. The FBAS British Open Final was also held, and an auction provided the opportunity for people to buy interesting home-grown fish (although not, one hopes, those who had just decided to start up a tank after seeing the exhibition!).

The spirit of collaboration and friendship between the two aquarium federations and all the participants was in evidence throughout the weekend and during the excellent dinner on the Saturday night, which was extremely convivial. The dinner was enhanced not only by the excellent food and company, but by the fact that the diners were seated directly in front of the main viewing panel of the Caribbean tank - this must be one of the most impressive settings for a dinner anywhere. The weekend was enjoyed both by the 7500 visitors who passed through the gates (in spite of the Cup Final!) and by all those involved, and both thanks and congratulations to Peter Furze and all the others who assisted in any way with the

BACK TO BASICS

herculean task of pulling together the manifold strands to make the event a success. Apparently further (and even better!) events are in the pipeline, so anyone who missed the millennium exhibition would be well advised to take the time to visit in the future.

FISHING ON THE NET

by Motley

I am a beginner to the Worldwide Web, but for those of you who have not, as yet, tried this magical resource, I would thoroughly recommend it (but only at weekends when telephone calls are at their most economical). I would also recommend that you put your service provider on your Friends and Family list to help even more!

The first site I explored was Aquaria Central, which can be reached at:

http://www.aquariacentral.com/

I was greeted by a wide variety of features available to me, but as I was not wanting to buy on the Internet, I found the advertisements and attempts to cajole me into buying something rather annoying.

For those of you who have not visited this site, you can find plant and fish profiles, books, fish and plant photographs, do-it-yourself equipment and a multiplicity of other information pretty much guaranteed to 'tickle your fancy'. There is breeding information if that is what you are looking for and the opportunity to 'chat' to other fishkeepers across the world using the net.

There is a search engine available to find a specific entry if that is your requirement.

If you have not already looked at the Aquaria Central site, I would advocate that you do so. I certainly enjoyed my visit.

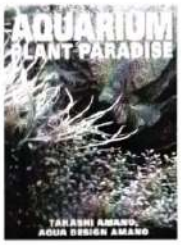
Top left: Malaysian Fish Farm
Top right: Water Hyacinth on farm ponds
Second left: Typical earth 'ponds'
Second right: Orchid farming
Third left: Holding tanks
Third right: Breeding tank using Water Hyacinth 'spawning mop'
Bottom left: Apple Snail eggs

SETTING UP YOUR FIRST AQUARIUM
Reviewed by Roger Crew

Dr Herbert R Axlerod
TFH Publications
ISBN 0-7938-0350-0
64 pages - Publisher's price £4.95

Good pictures of the usual excellent TFH standard, covering a wide range of fish and aquaria. One of the books in the "First " genre, covering the basics required to start. Most aspects are well covered without being too "Technical" but I did expect to see some mention of the Nitrogen Cycle and "new tank syndrome" These classic omissions and the doubtful identification of the Corydoras on page 53 aside, this book is well presented. The reader is advised to contact *the pet shop owner* for technical assistance and I suppose that could be deemed appropriate for a starter book suited to a newcomer. At £4.95 this is the book that may be purchased to tempt a youngster into the hobby.

AQUARIUM PLANT PARADISE
Reviewed by Roger Crew



Takashi Amano
TFH Publications
ISBN 0-7938-0518-X
64 pages - Publisher's price £9.95

Now I know I am not adverse to "taking the rise" out of the constant use of Takashi Amano photographs etc as not very subtle advertising within other TFH fish books, but you have to give credit to this guy, he is good!

This book is half "coffee table" and half reference, it contains many superb photographs and is interspersed with many valuable tips to give the reader insight into the methods by which Mr Amano produces such superb works of art.

If you are envious of the flawless aquatic forests and gardens typical of Amano, why not indulge yourself? For less than a tenner perhaps you may come close to replicating the standard of his aquaria – perhaps!

MALAYSIAN FISH FARMS
by Sue Crew

We arrived at the Trade Centre bright and early for the visit to the Malaysian fish farms which was due to depart at 9am. We eventually set off at about 9.45am! As all good travellers to Malaysia should be, we carried with us and were liberally doused with mosquito repellent. Travellers to Malaysia should take the appropriate medication for Malaria (which can still be a killer) and should use a strong insect repellent.

Because of the state of the 'roads' on which we were to travel we were transported in a number of minibuses, which thankfully were air-conditioned. We made our way to the Singapore-Malaysia causeway and customs point. At this time of day the traffic (foot, bike and motors) is horrendous. We had to queue for about ten minutes to pass through immigration control. Previously we had had to complete a questionnaire on how much money we were taking with us, etc. Some of the questions seemed a bit ambiguous, but they let us in so I suppose the paperwork was OK.

Entering Malaysia from Singapore is a bit of a culture shock. Singapore is full of high-rise concrete tower blocks (albeit well-designed concrete tower blocks) and just over the bridge it seems to be the same in Malaysia as the 'frontage' is high-rise with massive advertising hoardings, etc. along the coastline facing Singapore. However, when you get behind this facade a very different and more rural Malaysia greets you. Johor Bahru has dusty roads and small, much more 'ethnic' shops than the sea frontage would have you believe. It is a very pleasant surprise to find the 'small' behind the 'big and brash'.

Malaysia is such a mixture that you surely could not feel bored when travelling within it. There are areas of development where everything is big and new, but also areas where the 'real' Malaysia shines through and the variety of cultures which makes it up form a kaleidoscope of colour and sound. At the other end of the scale, however, is the extreme poverty in which some Malaysians still exist. It is rather poignant to be in a 'chrome, marble and carpets' hotel one moment and to look yards from it to see people living in little more than shacks with dirty litter-filled stagnant streams as their frontage. One thing that is true of Malaysians whether they be rich or poor is the hospitality their visitors are shown and the polite manner in which all are received.

We traversed what seemed like a lunar landscape of red sand to get to the first fish farm. It was amazing. One moment we were travelling along a tarmac road which seemed to go on for miles through an alternating landscape of red desert and lush green forest and suddenly we came upon a group of new buildings we were told was a new industrial complex which had been completed the year before, but had few tenants as yet. We went through the industrial estate, out the other side and then really met some rough terrain. I was suffering from dehydration at the time which tends to give the sufferer a splitting headache and a queasy stomach, which was not helped by the bouncing of the minibus.

Goldfish farm feeding/holding arrangements

We were met at the fish farm by its owner and provided with refreshments. The farm was on a site of about 12 hectares and catered mainly for Tetras. In large filtered concrete vats we saw thousands of Glowlights and other Tetras which had been caught prior to being shipped abroad. These vats were under cover and were adjacent to a multitude of small tanks which all had one Water Hyacinth plant in each. When you looked closer you could see that most of the tanks also had a pair of fish in them. These were the breeding tanks and the Water Hyancinth used as a natural breeding mop for the eggs to be laid into. The adults are removed once they have laid their eggs and the fry left to hatch. These are then removed to larger tanks to rear on for about six months prior to being sold.

Fish are caught from outside by hand and then sorted by hand according to size. We witnessed the packing of fish ready for export and the quantities which are sent out each week, both of which are impressive. The breeders do care for their fish whatever you may envisage or be told. They pack the fish in large plastic bags with a good quantity of air for the journey.

Goldfish held prior to shipment - note quantity

Sorting the Goldfish by hand

Then we went outside to see the large concrete vats used for growing on the fish. The water all looks muddy and there is no aeration or filtration in these vats, they are like massive concrete ponds. Apparently the water is changed as and when the staff think it is necessary and there is no schedule for doing so. Each of these rearing vats had its own Plec to keep it

clean and this was something we came to expect to see as we became familiar with the fish farms of Singapore and Malaysia. Most of these Plecs were well fed and well grown at about one foot long!

In the concrete drainage canals alongside the vats there are families of 'feral' fish living quite happily. Supposedly at one time some were dropped and have lived 'happily ever after'! These fish are usually Poecilia.

We were all then shepherded through the adjacent orchid farm to another fish farm which had not originally been on the itinerary. On the trip across we witnessed the orchids being grown under netting in vast fields. It was all rather alien to the British eye. After all we expect to treat orchids with care, not just to grow them in a field!

Another product of the fish farm was Apple Snails and a couple of the more natural mud vats had been laid aside for the breeding of these little creatures. Our attention was first of all drawn by the coral-pink eggs encrusting the overflow and water feed pipes.

We witnessed a veritable carpet of Water Hyacinths in full bloom, something which we would rarely see in Britain, but something which is fairly commonplace in the tropics!

The size and variety of Damselflies was also astounding, but we did not see any Dragonflies on our travels. For those of you interested in butterflies, again the range and size was something to see, but difficult to talk about unless you have some knowledge of the hobby!

Have you ever heard of 'coldwater' fish existing quite happily only a couple of degrees off the Equator? Believe me they are quite happy there. Please don't ask how they do it, but there are hundreds and hundreds of fancy goldfish varieties kept in what amounts to soil pits filled with water. I do not know how hot the water was, but it certainly exceeded the temperatures that we would expect to keep these fish at in Britain.

The sheer magnitude of the goldfish farm shocked Roger rigid. He said there must have been at least 100 large soil ponds all containing Goldfish of one kind or another. The vats varied in size depending on the size of fish.

When you visit fish farms and see the conditions in which the fish are bred and reared it comes as no real surprise that they do not always thrive when we dump them in a pond or tank in the UK.

At the last farm we visited on our short tour of Malaysia, Roger asked what the Snakeheads were swimming around just outside the net compounds which are used for rearing on fish. He got a bit upset and we could not understand why until later. Apparently Snakeheads and farm fish are a bit like foxes and chicken, they do not mix very well. The Snakeheads 'walk' across the ground to get into the fish troughs and then proceed to find their way into the nets over night. During the course of two or three nights they can empty one of the net compounds. The owner of the farm then got his revenge on Roger by saying that they would dispose of the Snakehead overnight so that fish stocks would be preserved. Unfortunately, we never did find out what type of Snakehead it was.

This farm mainly produced 'bread and butter' livebearers, i.e. Guppies and Platies.

Although we had visited three Malaysian plant farms with John Dawes when we last visited "Aquarama" in 1997, we found plenty of new experiences - and terrain - to interest us.

The quality of all the fish we saw during the day was superb. The Malaysians are an up and coming producer of tropical and coldwater fish. So far the farms have not been troubled by disease in the same way

that other countries have previously been (e.g. Neon disease, etc.). The farm owners seemed to be fairly philosophical about the likelihood of disease infestations saying that they advocate destroying whole stocks if necessary to maintain a good quality export. They believe that this has been the method which has contained disease and prevented an epidemic developing in the past when disease has struck.

The farms visited are not by any means obvious to the casual traveller as most are situated what certainly seems like several miles off the main road and most really require a four wheel drive to get to them as the 'roads' are little better than dirt tracks, which are often heavily rutted. It seems quite strange to look out of the minibus window and be passing through dense jungle containing rubber trees, a wide variety of palms, ferns and orchids. This all adds to the sense of adventure,

however, when you do get the opportunity to visit.

The Malaysian fish farms - and the plant farms we saw in 1997 - are fairly basic in their construction and rather low tech in the facilities and equipment. This does not detract from the quality of the fish raised or the care which is lavished upon them. The pride witnessed at each of the establishments visited was immense and the visitor can only guess at the heartache and toil which has gone into digging out and making the vats and ponds in which to raise the fish. If one assesses the sheer distance from the main road and the terrain to be crossed prior to reaching the sites of the farms even that would give you goosepimples if you consider how much earth must be moved and how much concrete and other materials are needed. Sheer grit and determination must have been necessary to decide to set up a fish farm in the middle of nowhere: pure vision must have been required in seeing the potential of the area upon that first visit.

What *has* been omitted during this account is that we were provided with a superb hot and cold buffet lunch in a rather smart hotel. The food included spicy chicken, salad vegetables, baby corn cobs, a variety of rices and noodles, oriental-style jelly, fresh fruit, and a multitude of other gorgeous goodies. Unfortunately because I was feeling pretty grotty by this time, I was miffed at being unable to sample most of it! All I managed was a piece of pineapple and some cucumber.

The day was quite long and made even longer by getting back to the World Trade Centre over two hours late, but it was one which we would not have missed. It was a shame that I was unable to enjoy the day more - I not only missed most of lunch, but also missed the third of the four fish farm visits and rested in the minibus. We were treated like honoured guests during our visit by everyone we came into contact with and would like to thank all of the owners of the farms we visited for their hospitality and the quite considerable time they spent in showing us round and answering our questions.

MY HOLIDAY

by Tarquin Kisser

Well, we all know She's been on holiday. I'm sick of hearing about it and so is everyone else! All She talks about is how beautiful those Australian (or wherever it is She's been) fish are. It makes me feel really good, I can tell you! Well, *I* have also been on holiday. By being on holiday I've been able to study much more closely the genus Homo sapien and have made some startling, amazing and down right frightening observations!

To start at the beginning... When I realised She was shipping me out so that She could go and enjoy herself, I was quite annoyed to say the least. However, as it turned out I've had a great time. I went to stay with someone called Mr. Chadwick (we - his friends - call him "Chad"). He's a lovely man, but by heck, that laugh don't half give yer a headache! To be honest, although I'd never tell him, I thought we'd been put up with some hens. As you can see my English has improved somewhat. I just hope I can keep it up. Probably not. A few weeks back with Her and it's all starting to slip. She's so common!

Unlike Her, Chad has lots of friends and visitors and they are the 'correct' type of friends I might add. Her friends do not like fish. You know one actually looked into my tank once and said, "So this is Tarquin. He's ugly, ain't he?" She did defend me, though.

Anyway back to the subject in hand. Whilst I was on holiday I met many of my fans, which was very nice for them as they don't often get the opportunity, although I

do understand that I am to be taken out more in the future. You see my 'public' naturally want to see me. I will now, however, be entered into any shows, so we can still keep our Union going. Perhaps **we** could even judge them Judge things.

(I've tried not to make this paper too technical, so therefore I've kept my observations simple.) The first exercise was to try to classify two Judge things that I met. As you know we haven't really discovered whether or not they are all the same species and this is made more difficult by the way they look. The two I met on holiday must be the same species as they were both called Brian. However, this is where the similarity ends. I would say they were both mature specimens, but "Brian 1" is so much longer and narrower than the other one. He has more of that stuff coming out of his head and none around his mouth. "Brian 2" isn't as long, but is wider; and also he don't have so much stuff coming out of the top of him, but a lot coming out near his mouth. The sounds both Brians make - although not totally different - are not the same. Had I not heard the names and therefore knew that they both belonged to the Brian species, I would have never believed it. Perhaps it needs more careful research with more questions answered, like: are there any more Brians out there? If so, what do they look like?

Another observation I've made is this: the tops of their heads are all so different. When the sun shines onto Mr. Chadwick's, it dazzles you. Another that nearly dazzles you is Dad's and that's quite strange, really. He doesn't really look any different until He bends down. The first time I saw it, it really gave me a fright. Actually I think He suffers from Hole in the Head Disease, because right in the centre of where that stuff grows is a hole. I really can't decide if I should mention it. I know I moan, but I wouldn't like anything to happen to Him. Perhaps if anyone has any ideas out there as to how I would approach this delicate subject, they could let me know.

Two of the Judge species I noticed (which incidentally are the same species, but are totally different) are the ones called "Clive judge". One is quite 'cuddly'. She won't let me be 'nasty' about him because I think She fancies him. I know he fancies himself. I was very annoyed when the newspaper used his picture at last year's Show instead of mine. I think perhaps he told Her not to take me so that they would put his picture in the paper instead of mine. He thinks because he's called a Judge he's better than me. I don't need those glass things on my nose, but he does, so how can he be better than me?

I digress! The thing that is really strange about the other Clive species is that he walks around with this long brown thing in his mouth smoking and is obviously on fire... He also wears them things on his nose you look through and, guess what? He looks over the top of them... Now, if those glass things are there to enable Humans to see, why do the Clive species look over the top of them and why did She fall up a step She thought was nearer because She was wearing those glass things? She only seems to wear them when She sits down!!!

The other thing I've noticed about Her and Dad is that they seem to have more colour than they did before they went on holiday. Perhaps they're in breeding condition? Talking about colour... my next observation was on the Paul species. There I made a remarkable discovery...

Paul 1 is again long and narrow. The thing on the top of his head is very crinkly. Paul 2 is short and wide. There are two very startling differences between these which lead me to believe that whoever was responsible for naming them got it very wrong indeed. I can only assume it must

have been one of those Judge species who left his white stick at home on the day he named them...

The startling differences are: Paul 2 has a tail that is growing out of the wrong place! There isn't another species I know of that has a tail growing out of that part of their body! He also has the stuff growing around his mouth, but none on his head - well, at least not all over his head. The biggest difference of all is that they are not the same colour. Paul 1 is a darkish brown colour, whilst Paul 2 is a funny pinkie-white colour. I haven't been able to ascertain if there could be something wrong with Paul 2. Perhaps as Humans mature, being made of meat they start to go 'off', or perhaps again it could be something to do with breeding condition! Considerably more research needs to be done on this subject. I also noted that the noises they make are completely different. Paul 1 makes a rather strange noise. Someone did mention that this was something to do with him coming from Liverpool! I believe that this could possibly be a sub-species of the Pauls.

That's all for now folks, see you soon!

Tarquin

"AQUARAMA 1999"

by Sue Crew

"Aquarama" was held at the World Trade Centre, Singapore between June, 1999. It is a biannual show. The first days were 'trade' visitor days and as experience showed us in 1997, a lot less busy than the 'public' days. The first part of the week is much more laid back and friendly with people meeting up from the four corners of the world who probably have not seen each other since "Aquarama 1997".

The exhibition had spread into two halls this time, with much more space to walk around in. There seemed to be quite a few exhibitors missing from two years ago, though. Roger and I were not the only people to make this observation as several of our contacts expressed the same fears. It seems as though "Aquarama" is suffering the same fate as the UK shows and exhibitions. They have already tried to 'maximise' on the exhibition by including "Zoorama". (If "Aquarama" is the 'fins', then "Zoorama" is the 'fur' and 'feathers'.)

"Aquarama" is very much a trade show, but is also of interest to the dedicated hobbyist as they can pick up information on new developments prior to finding them on the shelves of their local aquarist outlet.

We had made plans to meet up with Sumit and Rina Dutta from Calcutta whom we (and others within our group) had made friends with at "Aquarama 1997". Do any of you remember the little catfish on the front of the first "Fishworld" I edited? It was Roger's hand, but Sumit's fish. As the result of this friendship Sumit has exported many fish to the UK since 1997. Some of you will have purchased them and will, by now, be showing them.

The actual exhibition and competition of fish seemed to have 'shrunk' since the previous "Aquarama" unless I am much mistaken.

The fish part of the show leaves me a little 'cold' as I cannot get too excited about cultivated varieties of fish, especially when they appear to be mutated from the natural species into what I perceive as a grotesque gargoyle. Some of the cultivated species witnessed at "Aquarama" and back in the UK have difficulty carrying out the fundamental functions of a fish with any great conviction (e.g. swimming). I apologise to those of you who see a vision of perfection when you look at a

fish with a bloated belly, popping out eyes and a lump growing out of its head that can only manage the equivalent of a fishy 'waddle' around the tank. I cannot join you, but that does not necessarily make you wrong. Give **me** nature every time!

I have seen - and I must admit owned some in the very early days of my fishkeeping when I knew no better - Balloon Mollies in aquatic outlets, but I have never before seen Balloon Platies. I suppose it was only a matter of time before someone managed to produce a Balloon Platy if I had really thought about it. At "Aquarama" there were some very bent spined, big bellied, large-sized Balloon Platies in a variety of colours.

The Balloon Mollies have been confined to a few basic colours, but the Platies open up a whole new range of colours and markings, for example, the blue Mickey Mouse. These are fish which will appeal to a sector of the hobby, but I do not know how well they will breed

on, if at all. The shape and agility of the fish must reduce the likelihood of producing viable fry, I would think.

The Swordtails displayed were of reasonable size, but nothing like the size of those 'beasts' our elder statesmen in the hobby tell us used to exist. The finnage of the Swords has been developed, overly so in my opinion in some cases. Some of the hi-fin varieties were ridiculously high and seemed to make the fish swim slightly to one side when the fin was not extended. Mind you, I have to admit they were a pretty impressive sight when the fin was erect! Other Swords exhibited had different fin formations that appeared quite interesting.

Oriental fishkeepers/breeders have a penchant for Goldfish and Guppies. Some of the Guppy colour variations were quite striking, but I wonder just what other permutations are left to explore? Unfortunately the photographs of the Guppies did not come out all that well, but the blacks were - as usual - superb. Some of the colour varieties seemed to be just a 'variation on a theme'. The 'blond' varieties were quite striking, though.

As usual the ornamental Goldfish were the centrepiece of the exhibition. For those of you who worship such creatures, you would have been in fishy heaven.

CONSERVATION ISSUE

by Nora Green

"In the Far Corners of the Earth, Man's Poison is Wreaking Sexual Havoc on Nature..."

or

"Toxic Timebomb in Polluted Lagoons of Doom..."

Just a couple of recent headlines to remind us that the turn of the century is quickly bearing down on us - should we be concerned that the world is about to come to an end or fear the environmental timebomb, with its volatile fuse ready to suck us up into a vortex of disaster?

Since the Second World War, when the introduction of man-made chemicals into the environment took off, human sperm counts have fallen, whilst breast, testicular and prostrate cancers have increased. Chemicals in timber preservatives, fly sprays, head lice shampoos have been linked to depression, fatigue and cancer, yet we still continue to use them.

Peter Beaumont of the Pesticide Trust said, "There are more than 400 pesticide chemicals in the environment. Many of which may be harming human health in ways we still do not fully understand."

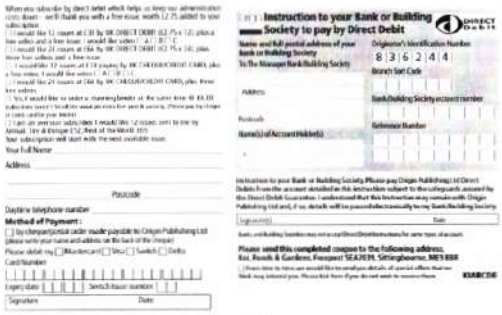
Another vicious circle begins when chemicals get into the environment through crop spraying, waste dumping and factory discharges. The 'gender-bending' chemicals enter the sea and are absorbed by plankton, which are eaten by fish, who in turn are eaten by seals, they are then eaten by polar bears and Eskimos. The consequences are...

Hermaphrodite polar bear cubs have been found in the High Arctic. Their mothers may have eaten the contaminated seals.

Eskimos on the Canadian Arctic carry large amounts of pollutants in their bodies - possibly from eating large amounts of whales, seals and fish. There are fears that Eskimo mothers may pass it to their babies.

Ironically, the very isolation, which normally protects the polar bears, seals and Eskimos from factory pollutants, could, in time make them more vulnerable. They may be victims of 'global distillation'. Long lasting synthetic chemicals, evaporating in warmer climates rise into the atmosphere, cool and drop down. As the cycle is repeated they head further north or south concentrating eventually on the Poles.

Although there is no concrete scientific proof that exposure to chemicals is the cause of - or even a major factor - in these phenomena, common sense should tell us that exposing animals to chemicals that mimic male or female hormones will only destroy the natural balance built up over thousands of years.



This year it was discovered that male fish were being feminised in rivers downstream of sewage plants. In some rivers every male Roach was found to be carrying eggs or possessing female reproductive tracts. Similar problems were also found in Gudgeon, Dace, Chubb, and Bream. Salmon and Trout are also at risk.

Male Flounders have become feminised where the Tyne, Mersey and Solway meet the sea. One of the problems is that chemicals can last for decades; the eggshells of the British Great Tits still carry traces of the insecticide DDT several years after it was outlawed here.

Toxic Timebombs

The Worldwide Fund for Nature warned recently that lagoons of dangerous waste from heavy metal mines are leaking into riverbeds, poisoning fish, birds, agricultural fields and water used by humans.

More than 400 kilometres of rivers in England and Wales are polluted. In Devon and Cornwall more than 1700 abandoned mines pose a problem for 212 kilometres of river. Wales has more than 500 abandoned metal mines affecting rivers near Aberystwyth, a dangerous derelict mine in the Conway Valley, north Wales.

The phenomenon is world-wide, in Florida, alligators at one lake were found to be suffering from reproductive problems 14 years after the pesticide spill suspected to be the cause, while the Florida panther has similar problems.

Dead Belugas washed up in Canada contained enough pollutants to be classified as hazardous waste.

Are Rivers Now Too Clean For Fish To Survive?

That seems to be contradictory, however it is also true. One expert fears salmon could be heading for extinction while others are shocked by the rapidly falling numbers of coarse fish such as Roach. The National Federation of Anglers abandoned its national championships on the Trent for the first time in 17 years because in the past two years 20% of competitors failed to catch a fish, unthinkable 20 years ago.

On the Witham, in Lincolnshire, fish stocks have plunged by 66% in 15 years. The Great Ouse, the Wye, the Monmouth and the Swale suffer similar problems. The NFA says the water has become 'very clear' and the prime suspect is the water industry, which has spent £9billion cleaning these rivers up.

The River Trent is now so clean it is now a tap water source and the NFA suspects this may have deprived young Roach of their 'suspended solids' diet and left them unable to survive the winter. A spokesman said, "The river seems to be chemically clean but biologically dead."

Again chemicals are to blame.

Last Rites For The Reefs...

The death knell has been sounded for one of the natural wonders of the world. Scientists said Australia's Great Barrier Reef will be destroyed in about 50 years. The 1250 miles of coral, which has taken millions of years to evolve, is suffering from a disease similar to brittle bone disease in humans. Rising levels of carbon dioxide in the atmosphere are making the sea more acidic - so reducing the coral's (tiny living creatures) ability to develop strong skeletons which form reefs. The coral is being weakened and can crumble more easily from natural erosion or structural attack. Rising sea temperatures have been blamed for damaging other reefs from the Red Sea and the Caribbean to the Seychelles and South East Asia - and it is expected that by the year 2050 the world will witness atmospheric carbon dioxide concentrations not experienced on this planet for 35 million years.

Dr. Michael Warhurst of Friends of the Earth warns that the true impact of the West's love affair with chemicals may only now be emerging. "We still have not really begun to measure the effects. Many of the sex-change examples of animals have only been found because we started looking. We simply do not know how many more problems there are out there."

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Welcome to the September edition of the Judges News Page and as you are all aware this is the seventh I have written on behalf of the Judges and Standards Committee.

The senior judge checklist seems to be working very well and I would like to thank all senior judges who have sent in forms. Please keep them coming in.

We are coming to the end of the show season and I would like to remind all judges that workload forms and size adjustment forms will be due very soon and from this year I will NOT be sending out reminders as I have done in years gone by.

In the Summer 1999 issue of "Fishworld" I asked if anybody found the deliberate mistake in the 1999 size sheets and it seems that you have all been stumped. The mistake was in the date on the bottom of Class H - it was printed as 1998 and should have been 1999!

Whilst on the subject of size adjustment forms, I would like to remind all of you that any adjustment - either increasing or decreasing in size - can be sent in at any time so that we can evaluate this earlier and not leave a large amount of work to be done at the last minute. Again I would like to hear from anyone with regard to size adjustments.

Again a number of judges have had upgrading tests this year and all the new appointments will be in the new edition of the Year Book.

Colin Pannell,
9 Edwin Road,
Hastings,
East Sussex TN35 5JT

Some frantic 'behind the scenes activity' at Hampton Court
Photo by Sykfish

FBAS MERCHANDISE AND PUBLICATIONS

Available from Show Stands, by Mail Order, or at General Assemblies

Book No.			
1	Cultivated Fishes		£1.00
2	The Sunfishes		£1.00
3	Show Fish Guide (including binder)		£5.00
3	Show Fish Guide - Supplements		£1.00 ea.
4	Goldfish Standards		£1.00
5	FBAS Constitution & Show Rules (1999)		£2.00
6	National Show Fish Sizes (1999)		£3.00
7	FBAS Yearbook (1999)		£1.00
8	Forming a Society		£1.00
9	Dictionary of Common/Scientific Names (Freshwater)		£2.50
10	Scientific Names and Their Meanings		£1.50
11	Plants		£1.25
12	Dictionary of Common/Scientific Names (Marine)		£1.25
13	Nishiki Koi (in colour)		£1.50
14	Organisation of the Open Show		£1.00
~~15~~	~~Revised Cichlid Names & Show Classes~~	Out of print	~~£1.00~~
~~16~~	~~Rasboras~~	Out of print	~~£1.50~~
17	Goodeids		£1.50
18	Quiz Book 1		£1.50
19	Synonyms of Fish Names		£1.50
20	Longfinned Variants and Others		£1.50
21	Tropical Species		£1.50
22	Tropical Species		£1.50
23	Tropical Species		£1.50
24	Not yet published		
25	Quiz Book 2 (new)		£2.00
26	Species Reference Guide (looseleaf - £1.50)	(with binder - £4.00)	
	Binders for booklets and supplements		£2.50
	Car Stickers		£0.20
	Lapel Badge		£1.00
	Rules		£2.50
	Pointing Disc		£3.50
	Fish Penknife		£1.50
	Key Fob		£1.25
	Refrigerator Magnets/Fish Brooch		£1.00
	Plug Label		£0.25
	Sweatshirts (FBAS) -		£9.50
	T Shirts (FBAS)		£6.50
	Umbrella		£10.00
	Holdall		£9.00
	20 for size badges		£0.20

ORDERS:

BY POST Send cash/cheque with order + 25% of total for p & p
Cheques made payable to FBAS
Send to: Address in FBAS Year Book (1998) or
Roger Crew c/o HMP Albany, 55, Parkhurst Road, Newport, Isle of Wight PO30 5RS

SHOWS Telephone orders for collection at Assembly or shows

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!**

Here is the opportunity for all of you marine or Rift Valley enthusiasts (or any fish-keepers for that matter) to create a coral scene **without damage to the environment,** for **Coral Creations** are a synthetic resin product which is totally inert and harmless to your fishtank. Now you can enjoy the sight of lifelike 'coral' at a fraction of the cost.

As an example, the top of the range "Brain Coral 1/2 helmet" which **normally would**

1999 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 NGS = National Goldfish Standards

4.9.99	**FBAS General Assembly - Delimember cards for free admission to view Syon Park**
5.9.99	Alden AS (FN), FSAS Council Meeting, Wyke S (Y)
11.9.99	Bristol AS (FB), Hounslow AS (FB)
12.9.99	Cramlington AS, Silktown (FN), South London AS (A), Mid Somerset (B)
17.9.99	Doncaster AS
19.9.99	NACC (F), Otley AS (Y), FSAS Auction, Mid Sussex AS (FB)
25.9.99	NGPS (NGS)
25/26.9.99	IOW Koi Club (B)
26.9.99	Darwen AS (FN), Fair City S (U), NEFAS (N)
2.10.99	Goldfish Society GB (NGS)
3.10.99	Basingstoke AS (A), Grangemouth AS (FN), Halifax AS (FN)
10.10.99	Doncaster AS (Y), Washington AS & P (FB)
17.10.99	Kirkaldy AS, West Cornwall AS (FB)
23/24.10.99	**British Aquarist Festival, George Carnell Leisure Centre, Manchester (F)**
31.10.99	FSAS Annual Conf C (FS)
6/7.11.99	ASAS Millennium Convention (inc. Supreme Championship) (FB)
7.11.99	Merseyside AS Auction, Bradford AS (Y)
12.11.99	Doncaster AS Auction
21.11.99	FSAS Council Meeting, NACC Auction
4.12.99	**FBAS AGM - Del/member cards for free admission to view Syon Park**

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 from:

SHOW INFORMATION,

Dept. FW, 22, Flamsteed Avenue, Wembley, Middlesex HA9 6DJ