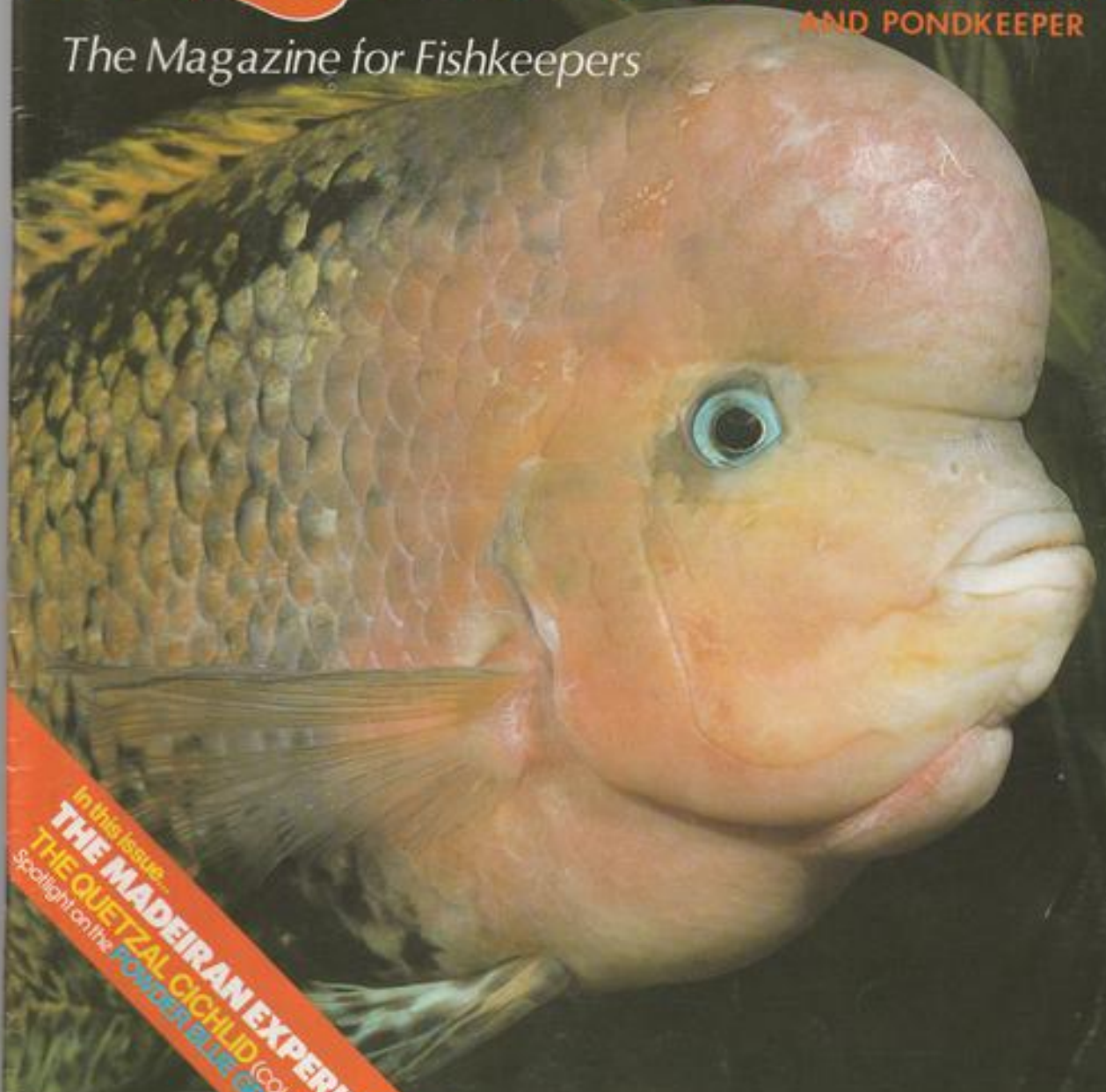


SEPTEMBER 1984 80p

AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



In this issue...

THE MADEIRAN EXPERIENCE (Part 2)

THE QUETZAL CICHLID (COLOUR FEATURE)

Spotlight on the **POWDER BLUE GROUPER**



COVER STORY *Photo: A. van den Nieuwenhuizen*

The Quetzal Cichlid (*Cichlasoma synspilum*)—sometimes referred to as the Firehead Cichlid in American literature—is found in the wild along the Atlantic slope of Central America, from Guatemala to Belize. Although a maximum size of around 12 inches is usually quoted for this species, larger specimens have been recorded from time to time. A high and unpredictable level of aggressive behaviour, "excellent" water-fouling qualities and a large appetite for plants makes this beautiful cichlid a less than easy species (to put it mildly) for most aquarists.

Mature males develop a pronounced, fat-filled, nuchal ("forehead") hump, particularly during the reproductive phase, which makes them impressive and spectacular and, no doubt, contributes significantly to the appeal of this species among cichlid enthusiasts.

Given adequate conditions, the considerable effort that needs to be put into keeping and breeding *C. synspilum* can pay rich dividends. Up to 2,000 eggs may be laid on a pre-cleaned spawning site by a fully grown pair who will defend their territory and offspring with tremendous energy.

Yet, even during this period, fights can break out between both parents, with the female usually coming off worst (other than at the egg-fanning stage when she appears to match the male in terms of status).

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Your questions answered...

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Every query receives a personal answer and, in addition, we will publish a selection of the most interesting questions and responses each month. Please indicate clearly on the top left hand corner of your envelope which department you wish your query to go to. All letters must be accompanied by a S.A.E. and addressed to:

Your Questions Answered, The Aquarist & Pondkeeper,
The Butts, Brentford, Middlesex TW8 8BN.

TROPICAL



Dr. C. Andrews

Tropical



white cloud mountain minnows...

What is the scientific name of the white cloud mountain minnow and what is the fish *Aphyocypris*, also known as the venus fish?

Can you also provide some information on how to breed white clouds?

The white cloud mountain minnow (*Tanichthys albonubes*) is very similar in appearance to the venus fish (*Aphyocypris*), the latter of which is now known to scientists as *Hemigrammocypsis linei*.



Tanichthys albonubes

The two fish can be distinguished by the fact that the mouth of the white cloud is slightly upturned (the mouth of the venus fish is on the end of the snout) and the nostrils on each side of the head of the white cloud are joined by a "furrow" (those of the venus fish are not). Because of their similarities, however, some authorities regard these two species as (perhaps) one.

The white cloud mountain minnow comes from mountain streams and hence good filtration and aeration and the regular replacement of part

of the tank water with fresh is a good idea. The fish is, however, quite hardy and will live under a variety of tank regimes. The temperature may be allowed to fluctuate with the seasons; 15-18°C in the winter to 20-22°C in the summer. Breeding is normally triggered by raising the tank temperature to about 20-22°C. These fish spawn amongst clumps of fine leaved plants, where the eggs adhere to the leaves. The parents are, perhaps, best removed and the eggs hatch after 48 hours. The fry require tiny live food at first, but will soon graduate onto brine shrimp and powdered baby fish foods.

terrapins...

Can you give me some information on the care of small terrapins, and can I keep them in my tropical fish tank?

To begin with I would not advocate keeping terrapins in a tank containing fish. Even if you could provide a dry 'land' area for them to rest on, the terrapins would probably nip the fins of the fish and even kill them.

There are three important factors in caring for small terrapins successfully: warmth, correct feeding, cleanliness.

These reptiles must be kept warm and away from draughts. A warm temperature of about 25°C suits them best. This almost invariably calls for the use of an aquarium heater-thermostat and keeping these animals at very much cooler temperatures will result in problems. Small aquaria are an ideal home for terrapins. In an unheated room during the colder months of the year, it may be necessary to also use a hood or coverglass. This will exclude draughts, reduce evapora-

tion and keep the above water temperature comfortable for the inmates. During the warmer months the hood may be removed and the terrapin allowed to bask in natural sunshine. For this purpose a dry easily accessible, sunning area should be available in the tank. This may take the form of a smooth rock or a piece of floating tree-bark. Rough rocks will damage the shells of these reptiles. If the tank is placed near to a sunny window, care must be taken to ensure that part of it is in shade to prevent over-heating.

Terrapins must be fed correctly. When very small they should be offered finely scraped raw meat, chopped earthworms and occasionally raw fish. Some terrapins also enjoy nibbling lettuce leaves and pond-weed from time to time. Fatty or cooked meat must be avoided. It is a good idea, and particularly important during the winter months, to add calcium and vitamin D to the diet of these reptiles. A diet low in these nutrients, along with our cloudy climate, can easily produce soft shells in terrapins. Simply roll the food in powdered cuttle-bone and/or fish liver oil about once a week. The terrapins should be fed three to four times a week, trying to avoid overfeeding. As they grow older they may be offered larger pieces of raw meat, fish and whole earthworms, etc. Tablet fish foods and *ReptoMin Food-sticks* are excellent staple diets for terrapins.

Terrapins are very messy feeders and hence the tank will need cleaning at least once a week. Remove the terrapin to a bowl of water at the correct temperature, and switch off all electrical appliances connected to the tank. Clean the tank out well and fill up to

COLDWATER

Arthur Boarder

PLANTS

Vivian De Thabrew

KOI

Hilda Allen

MARINE

Graham Cox

DISCUS

Eberhard Schulze

the desired level with water at the correct temperature. Switch on the heater-thermostat and then replace the covers. Without regular cleaning these reptiles may develop a number of disorders, including eye troubles. As a precaution, it is wise to wash your hands after dealing with these animals.

C.A.

Coldwater**joining butyl...**

I have a garden pond which is lined with a Butyl liner and I would like to make the pond larger. I have a large over-lap at one side and wonder if I could join a fresh piece of liner to it?

If there is a fair sized over-lap and the liner is in good condition it is quite possible as long as the old portion to be used is perfectly dry. Most firms who advertise liners will be able to supply you with joining tape and a sealant.

showing fish...

I have some good fancy goldfish and would like to exhibit them. Do I have to belong to an Aquarist Society to be able to show?

You do not have to belong to an Aquarist Soc., to be able to show at an Open Show. However, it will be a great advantage if you do belong to one. You may then be able to enter in a table show when you will find out what other people think of your fishes. You may think they are the cat's whiskers but as everyone knows, every mother thinks her own baby is the best. Your interests will be greatly

increased when you can meet other aquarists to exchange views. If there is no club in your district why not start one? Write a letter to your local newspaper asking for anyone interested in forming a club to get in touch with you. You may be surprised at the result. There may be several aquarists living quite near you. A meeting can then be arranged in someone's home and a start can be made.

control of breeding...

How can I stop my goldfish spawning in my pond every year? The pond is 5 x 4 x 2 feet and I had two goldfish in it. One has died but the fish must have spawned before as I have 11 young fish in the pond now. If they breed the pond will be over-stocked and I do not know what to do with the surplus fishes. If I feed them once a week will this stop them spawning?

During the past thirty-five years I have answered several thousand letters pertaining to fishkeeping and yours is the very first one to ask how to prevent goldfish from spawning. The usual request is as to how to get them to spawn. As long as there are fishes of both sexes in the pond and they and the water are in good condition, it is only natural for them to breed and you cannot stop them. You could have a number of water snails, (*Limnaea stagnalis*) in the pond as they could eat many eggs. However, do nothing until the spring and then see how many of your youngsters have survived the winter. Then if you have too many you can take them to your local

school where it is very probable that there will be at least one budding aquarist who would be delighted to take them off your hands.

best fancy goldfish...

I used to keep tropicals and now wish to go in for a type of fancy goldfish. I have two tanks each 36 x 15 x 15 inches. Which fancy goldfish do you consider most suitable for an indoor tank? I wish to keep one variety only. Also, where can I obtain good quality fish?



A healthy, sturdy fantail

There are several varieties of fancy goldfish for an indoor tank but I have found by experience that the most suitable is the Fantail. This fish does not dash around in a tank but moves about very sedately. Shubunkins, although handsome fishes, are inclined to be a little too active and Veiltails are rather sluggish and inclined to remain motionless on the bottom. The Fantail is also easier to keep in good condition as some of the varieties with flowing fins are more susceptible to fin congestion and fin-rot. I am enclosing an address from where you should be able to get the fish you require. It is a good idea of yours to keep one variety only, this prevents any cross breeding.

flowering plant . . .

I have a small fibreglass pool in my greenhouse and would like to have a flowering plant, but it is not large enough for a water lily. Can you recommend one please?

An ideal one for your purpose is the Water Crowfoot, (*Ranunculus aquatilis*). This plant has two types of leaves, an under water one and a surface one. The lower leaves are very fine, spreading from the stem, and good oxygenators. The surface ones are shiny and dark green, floating on the top like water lily leaves. In the early part of the year the plant produces many attractive small white flowers, shaped like those of the buttercup. Not only do the under water leaves help to keep the water pure but the surface ones will save the formation of green Algae by cutting down the light beneath. A.B.

Plants



starting right . . .

I have been reading an article in a tropical fish magazine about using a mixture of aquarium gravel, garden soil, and aquarium peat. The article didn't give any information on how to lay out this mixture. Please could you give me some information on how to use the mixture?

You say you want to use a mixture of aquarium gravel, garden soil and aquarium peat. Your gravel should be the fine type or small 'pea' gravel. I would recommend you use clay or clay granules rather than garden soil, as the latter varies tremendously in quality according to area and generally contains a lot of unwanted debris which could pollute your tank. Alternatively you could use fine loam, provided you sift it through a fine mesh to remove large particles of debris. If you are unable to get hold of garden clay, you should be able to obtain some clay granules from your aquatic dealer. The peat you use should be either peat moss

litter (i.e. the pulp remaining after the extract has been taken out), or peat moss which has been thoroughly soaked in water for some length of time, squeezed out and the resulting pulp used as the bottom layer of the mixture. This layer should be spread thinly on the tank bottom or just above the filter (if you use an undergravel filter). The layer of clay or loam (about ½ in.-1 in.) should be placed above the peat layer, then finish with your layer of gravel. The total depth of your planting medium should be at least 3½ in.-4 in. to allow your plants to develop good root growth. V.T.

Koi



a small pond . . .

The largest pond I can possibly make would be about 14 feet by 9 feet wide. Depth would not be a problem, but I would first like to know if such a pond would be suitable for Koi and how many fish I could have.

Your pond would be suitable for a limited number of Koi provided you are sensible and do not overstock. It should be 4½ to 5 feet deep to provide as large a volume of water as possible, and a biological under-gravel filter system should be installed of the required size for your pond, i.e. equal to one-third of the pond surface area. Koi from 6 to 8 inches in length would be an ideal size to start with and they will grow according to the space available.

All too often I hear from readers who tell me they only have a small pond, but where can they buy some 20 to 24 inch Koi? I am afraid such people have more money than sense, buying large Koi is easy compared to the problems of keeping them healthy in a relatively small amount of water.

The accompanying photograph shows an excellent example of what can be achieved in a limited space. The pool has an under-gravel filter of an adequate size and the water return is directed away from it to provide a good circulation and essential aeration.



The surrounding fence was a later addition following the loss of two Koi which in jumping (as all carp do), landed outside the pool. Such a barrier, or better, a lower water-level, protects fish from predators also.

I would suggest that when your pond is finished you visit as many Koi suppliers as possible to assess the type and quality of Koi available before choosing no more than 10 or 12 Koi in the recommended size range.

grass carp . . .

I have been told that by adding two or three Grass Carp to my Koi pond my problems with blanket-weed will be solved, can you please let me have your opinion.

Having heard of this before, I am not impressed by the value of introducing Grass Carp into Koi ponds. They will eat blanket-weed if no other food is available although it is not their preferred diet. On the other hand they will eat most of the varied foods offered to Koi and have the potential of growing into very large fish, thereby competing with the Koi for both space and food.

These Asiatic fish are not as attractive as Koi, but there is no danger of them breeding in Koi ponds requiring as they do special climatic conditions; and as they are herbivorous they present no problems to smaller fish. I know of an angler and fishkeeper who has introduced some Grass Carp into his pond and these are fed on his lawn grass-cuttings.

The effects of the resultant waste products on his pond water have yet to be determined, but if I were offered any Grass Carp as a 'cure-all' for the problems of blanket-weed my reply would be "Thanks, but no thanks".

H.A.

Marine



no hiding place...

Over the last 12 months I have successfully established two 40 gallon marine aquaria. I have experienced no problems with Angels, Butterflies, Clowns, Triggers and a medium-sized Powder blue Surgeon. However, on four occasions I have purchased either a Regal Tang or Yellow Tang and found the new fish dead within 24 hours.

The existing occupants of the tank are as follows:

- (i) Adult Emperor Angel (—very aggressive to newcomers);
- (ii) Yellow Longnose Butterfly;
- (iii) A triggerfish;
- (iv) Flagfin Angel;
- (v) 3 small Blue Chromis.

The seawater is a mixture of 'Ultramarine' and 'Natura' of which I change 5 gallons every 3 weeks. The S.G. is 1.021, pH 8.1. There is no nitrite reading, nitrates read 20.0 p.p.m. The 4 dead fishes seemed to be bloated and lose colour.

Since you are already keeping 3 quite delicate fishes—the 2 angels and the *Forcipiger* butterfly—quite successfully in this aquarium, one can obviously rule out any question of toxicity problems. Your water quality sounds excellent and 20 p.p.m. of nitrate is satisfactorily low.



A healthy *Forcipiger* indicates that water quality is not the cause of death of new fish

In the absence of any symptoms other than bloating and loss of colour, both of which occur quite rapidly after death at tropical temperatures, one can only assume that the fishes were killed

by either the Emperor angel or the Powder blue surgeon or both. It would certainly not be surprising to find that the new fish had considerable difficulty in finding a night resting place in such a well-stocked tank.

Few aquarists realise that the fighting which breaks out after "lights-out" between the established members of a community, (each possessing his own habitual nocturnal retiring cave or crevice), and a newcomer are frequently much more severe than the daytime skirmishes. During the daytime the newcomer can see his attackers and try to escape. When the lights are extinguished, the new fish is at the mercy of his assailants. It is for this reason that, except when adding members of the wrasse family, I have always strongly recommended that anyone adding a new fish to an established aquarium first re-arranges at least three quarters of the tank's layout of rocks and corals. This then ensures that the existing fishes are at almost the same disadvantage as the new boy. G.C.

Discus



gill flukes?..

My Discus have a problem which I diagnose as Gill Flukes (it cannot be anything else can it?)

The symptoms are as follows: Respiratory rate approx. 104 per minute. The fish feed well, after each feeding the respiratory rate increased to approx. 120 per minute for about half an hour. Then it will come down again to approx. 104 per minute.

I cannot get the symptoms to disappear if I use "Sterazin" for the prescribed length of time but find I have to use double the prescribed dose for it to clear. Even then within a week after treatment back come the symptoms!

My tanks are bare and kept absolutely spotless, pH 6.5; dGH 2° temperature 90°F. The only live food they have is white worm; other fare: flake food, Beef heart, prawns and garden worms.

I have read about C.O.D. which

is supposed to be effective against gill flukes.

Do you agree with my diagnoses?

I do not think your discus fish suffer from gill flukes! As you do not give enough information about your set-up, filtration and general maintenance I can only really generalise with my answer. Discus fish do not only have an increased respiratory rate because of gill flukes but also because the oxygen content of the water is too low and at the very high temperature of 90°F, it could certainly be the cause. At this kind of temperature a very strong aeration of the water is necessary. Or because the filtration is exhausted and needs looking after. Do use a large volume of a good biological filtering material and keep it fairly clean by using a prefilter. The prefilter will protect the main biological filtering material and make it more effective. The addition of an oxydator will also increase the efficiency of any biological material. Feeding flake food with all its many benefits will also enrich the water with a great deal of dissolved protein, etc., and consequently needs oxygen to be made harmless. Could it be that your water is too rich?

Certain medications will also "burn" the filaments of the gills if they are put into the aquarium without being diluted first. Very often discus fish will swim into it and this will certainly damage the gills. It will take quite some time for the gills to heal again. During this time the respiratory rate will of course be high.

The respiratory rate in young discus fish is also somewhat faster than in older fish. From my own observation, "healthy" youngsters breath approx. 40 to 50 times a minute just after having been fed. With older specimens it doesn't seem to make any difference. Older specimens kept in a healthy happy environment will breath only about 30 to 40 times a minute.

I do not think your discus fish suffer from gill flukes, because Sterazin should have cleared this up. The problem with your fish appears to be environmental caused either by the quality of the water or the filtration system. E.S.

The Madeiran Experience

Part 2 by John A. Dawes

In part 1 (*A & P*, May 1984), I wrote about the Funchal Museum and Aquarium based at 35 Rua di Mouraria in the Madeiran capital and of the tremendous hospitality offered me by the past and present Directors and their staff.

Placing the Museum's four-wheel drive "Jeep" at my disposal was a most welcome and generous gesture which made it possible for me to visit coastal sites (with members of the Museum staff) which would otherwise have been quite inaccessible. On some of these trips, the main aim was to photograph the sites themselves, list the species of fish and invertebrates found in tidal pools and collect material for the Museum's tanks and for further study back in UK in collaboration with Dr. Peter Miller at Bristol University.

Collecting was a relatively easy matter because of the abundance of fish. In one rock pool alone at Ponta da Cruz, a few kilometers west of Funchal, we caught no less than eight species of fish. In total numbers, there were well over 200 fish in the pool. The species collected at this site were (Portuguese names in brackets): *Thalassoma pavo*—Turkish Wrasse (Peixe Verde), *Diplodus sargus*—White Bream (Sargo), *Oblada melanura*—Saddled Bream (Dobrada), *Atherina presbyter*—Sand Smelt (Guelro), *Lepadogaster lepa-*

dogaster—Clingfish (Chupa Sangue or Pegador), *Mugil cephalus*—Common Grey Mullet (Tainha), *Parablennius parvicornis*—Blenny (Caboz de Cuoro) and, the most significant of all, *Mauligobius maderensis*—the "Madeiran" Goby (Caboz de Escamas), recently described and named by Peter Miller in honour of Jerry Maul, the former Director of the "Museu Municipal".



Clingfish, *Lepadogaster lepadogaster*, known locally as Chupa Sangue or Pegador. These specimens were collected at Ponta da Cruz.

In addition, there were countless shrimps, crabs (some bright orange in colour), hermit crabs, urchins, starfish, limpets, winkles, whelks, barnacles, snail and beadlet anemones, and unbelievably beautiful, abundant growth of calcareous and green algae. All in all—a marine aquarist's dream, and more, contained within a single pool. Personally, I can't wait for the day that marine algae become as easily available and cultivated as fresh-

water aquatic plants. In fact, after seeing the incredible growth of plants in even the most modest of Madeiran rock pools, most marine tanks don't look complete to me anymore.

Although some of the larger rock pools in Madeira are in rather inaccessible places, smaller ones which, in proportion, are just as "fertile", can be found along any stretch of coast. For example, the end of a small pier owned by the hotel we stayed at, joined on to a small island called Ilha do Amor (Island of Love) which had several, very luxuriant pools containing, at times, six or seven species of fish, numerous invertebrates and a thick carpet of algae. Collecting in these pools is simply a matter of having a decent net, buckets and patience. However, unless you have suitable bags for transporting specimens back alive, it is advisable to put everything back once you have had a good look and taken the necessary photographs.

Whereas the marine life of Madeira is varied, abundant, beautiful and exciting, the opposite equally applies as far as freshwater fish and plants are concerned. It was a great disappointment to discover that there are no indigenous freshwater fish on the island. The few species that do exist are all imports. There are some Brown Trout, *Salmo trutta*, (in a trout farm), numerous Goldfish, *Carassius auratus* (in private ponds, the Botanical Gardens and in the Jardim de San Francisco in Funchal), and very large Carp, *Cyprinus carpio* (in the lake in Parque-Santa Catarina in Funchal). In addition, there is another small, imported freshwater fish which I found in huge numbers in Funchal itself. However, I am currently preparing a scientific paper for the Museum's Bulletin on this species and protocol dictates that I do not reveal its name until that paper is published. I did manage to bring quite a few specimens back alive to UK, though, and an experimental breeding programme is already underway.

On the plant side, there are five



Even modest-sized tidal pools are amazingly rich in flora and fauna. This one at Ilha do Amor contained luxuriant plant growth, invertebrates and six species of fish

or six species found in the wild in Madeira. However, I only found one, Starwort (*Callitriche*), in my travels with Sr. Manuel José Conceição Biscoito, the current Director. One plant which I would have loved seeing was the Madeira Water Dropwort, *Oenanthe pteridifolia*, found on this island and nowhere else.

Most of the aquatic plants are found either in ditches or somewhere along the labyrinth of irrigation canals, called Levadas, which have been masterfully constructed over the years as the only means



The author (hands in pockets) with Sr Manuel José Biscoito, the present director of the Funchal Museum, standing by a roadside irrigation canal (Levada)

of watering the hard-to-reach upland crop fields. It was, in fact, in one of these Levadas, measuring no more than 1 foot in width, carrying only several inches of water and running through a small, remote highland village that we found our single clump of *Callitriche*.

Cultivated aquatic plants are a different matter altogether. A visit to the magnificent Botanical Gardens overlooking the city is a must if you want to see plants such as Water Hawthorn (*Aponogeton distachys*), Lilies (*Nymphaea* sp.) and Papyrus (*Cyperus papyrus*) in flower in November. In addition, there are massive specimens of Water Hyacinth (*Eichornia crassipes*) and Water Lettuce (*Pistia stratiotes*), as well as Arum Lilies (*Calla* sp.) and the ubiquitous Duckweed (*Lemna*, sp.).

There are only two fish shops (or shops that sell fish—along with numerous other pets) in Funchal. The range of fish species offered is quite limited and restricted, largely, to bread-and-butter stuff, such as Goldfish, Guppies, Angels, Tiger Barbs, etc. Prices seemed, if anything, slightly higher than in UK. This, bearing in mind the rate of exchange, makes life rather expensive for Madeirans wishing to take up the hobby. Not surprisingly, tropical fishkeeping is not a partic-

ularly popular pastime on the island. Consequently, there is no Madeiran aquarium magazine—I was able to find some old copies of a Portuguese magazine but was informed that it is now out of print and that there is no real demand for aquarium literature. I suppose that when you live in a place like Madeira, where the climate and pace of life are kind, where flowers confront you wherever you look, where there are no poisonous snakes, spiders or scorpions, and where (apparently) the only reptiles are the millions of virtually tame and beautiful lizards, *Lacerta dugesi*, this is quite understandable.



A large clump of Papyrus, *Cyperus papyrus*, in flower at the Botanical Gardens



One of Funchal's two petshops. Most of the fish sold are bread-and-butter species

Acknowledgements

I would like to extend my most sincere thanks to Sr. Manuel José Conceição Biscoito (the current Director of the Museu Municipal do Funchal), Mr. Jerry Maul (the former Director), Sr. João Costa de Nobrega, Sr. José Pedro Freitas Gouveia and Sr. João de Sá Pereira da Silva for all the help they gave me, their friendship and their good humour.

WHAT IS YOUR OPINION?



by B. Whiteside.

B.A., A.C.P.

'Photographs by the Author'

AS I WRITE this in July I'm looking at one of the best displays of roses I've ever grown in my present garden. The first flush of blooms is superb—despite the continuing drought that has lasted since Easter. Sadly, water restrictions were imposed several weeks ago when the use of garden hoses was forbidden, and most of my garden is bone dry—especially my lawns. The latter consist of many large, brown areas of dead grass that will never recover—even if it ever rains again. I've had to shade my greenhouse quite heavily by painting an appropriate shading compound on the glass: the strong sunlight was burning the plants' leaves and stunting growth. The temperature in the greenhouse can still touch 100°F with the door and the ventilators fully open. I'm glad I don't have an outdoor pond. What problems have you had to contend with this year because of the hot, sunny, rainless period—and the ban on the use of hose-pipes?

Photograph 1 shows a plant useful for shading outdoor ponds in summer. It's the water hyacinth, *Eichhornia crassipes*, which is a pest in its native waters because it can block up water pathways such as rivers and canals by reproducing. It would probably be wise to keep a few plants indoors to overwinter them. My thanks to Ron Baldry, who lives in the East

End of London, for allowing me to photograph his water hyacinth plants. Photograph 2 shows the ultimate form of shading for a pond: the giant waterlily, *Victoria amazonica*, which was named after Queen Victoria in 1838. Its leaves grow about six feet in diameter with a lip of about five inches high. I wouldn't mind trying a few seeds of it—even though I don't have a pond. Any free offers?

Some weeks ago I moved a large plant of my African fern, *Bolbitis heudelotii*, from a small tank into a larger tank containing eight growing angels. The plant was growing slowly but strongly, attached to a large piece of flint. Unfortunately the hungry angels ate most of the plant—so I've removed the rock and the remains of the plant and returned them to their

and changed the air inlet filter—I make mine from little circles cut from a square foot of ordinary, cream-coloured felt—as well. The result was a splendid improvement in the air output—which operates four outside filters with no trouble. I also spent about 15p on a new air-stone to fit to a Bubble-Up filter that I've had for years. The new stone, plus the new diaphragm, effected an excellent improvement to the operation of the Bubble-Up. I got excellent value for the little money that I spent on the new parts.

The following letter was headed 6 Golfside Close, Trapps Lane, New Malden, Surrey, and was written by Master Jon H. Stonehouse, who is 15 years old now. I included a letter from Jon in the July issue but did



Eichhornia crassipes—water hyacinth—a useful floating plant for the pond in summer

original home. What an expensive meal for the angels! They'll have to be content with Java fern and Indian fern from now on.

Recently I noticed that the air output from my excellent air pump had dropped off. I opened it up and after a quick check discovered that the diaphragm had cracked. If checking the diaphragm on an air pump, don't just look at it: actually take it off and bend it about. Sometimes cracks in the rubbery substance can go unseen unless one bends the rubber. I fitted a new diaphragm to my pump, for a matter of pence,

not know his Christian name then. He writes: "I was delighted to see you had printed my letter. I had forgotten I had written it. It was a nice surprise after internal examinations. Anyway, I thought I'd let you know that my first name is Jon."

"While I was searching through my drawers I unearthed a blurred picture of my highly-prized and now famous thread-fin butterfly fish. Quite a pleasant effect can be obtained with just a snap-shot camera.

"I was a little disturbed about your attitude towards curing inexpensive fish; after all, these creatures did not



Victoria amazonica — the giant waterlily

ask to be put in our tanks—and after putting them there we should do our best to keep them alive and happy. I also have some news about an excellent shop I discovered. I was there today and bought this month's copy of *The Aquarist & Pondkeeper*. The service was very good. They had several very large display tanks—both freshwater and marine—all filtered with the excellent Turize system. All the fish looked extremely healthy; and to my surprise I saw two, yes, two, French angelfish of about 16 in. in length. They made a stunning blue-face angel seem dull. The koi pool outside was amazing and the koi looked very happy. The shop is called The Aquarist (Chelsea) Ltd.

"Lynwood Fish House is in Tolworth and well worth a visit. I consider your column of readers' opinions to be invaluable, and the freedom to praise or criticise any product or shop extremely important to everyone. I hope to enjoy a long correspondence with you and I hope my opinions will be valuable. I'll end now because if you do print it I don't want to hog all the space. P.S. This is the only way I can talk about my hobby. My friends all consider it very boring. I suspect it may be the same for many adults: very frustrating. Good-bye!"

Jon's mention of koi reminds me of an amusing experience several weeks ago. We visited a new garden centre and my interest was taken by some large, flat, outdoor tanks containing coldwater fishes and plants. I was fascinated to see what was in the tank carefully labelled K10. I was tempted to get out my red pen when I found that the tank contained K01—

and that the proprietor of the garden centre obviously didn't even know the name (or the spelling) of the fish. I had a glance at his goldfish and moved quickly on without making a purchase. My thanks to the British Koi-Keepers' Society for the latest copies of their magazine. The July issue quotes an amusing misprint from "a local paper": "... thieves ... scooped £900 worth of Toy Carp and Blue Shilkenkers ... " Koi blimey!

In a recent issue I asked if anyone would care to invite me to photograph their koi because I have very few photographs of koi with which to illustrate my articles. I received very few invitations; but one that I did receive really did appeal to me. A Bedfordshire firm, that specialises in koi—especially very large ones—very kindly made me an offer I'd love to accept. Next time I'm on holiday in London the firm offered to collect me in the capital in the morning, take me to Heathrow to help unload imported koi if I select the right day, drive me to the firm's headquarters to spend the day unpacking and photographing koi, and to return me to the city in the evening. I must say that that would really appeal to me—and would make the basis of an interesting article for this magazine.

Mr. Ian K. Mills lives at 63 Barn Lane, Olton, Solihull, West Mids. He writes: "First of all I must say

how much I enjoy reading W.Y.O.—other people's ideas always leave food for thought. In the April issue you asked for information about *Cryptocoryne* species. I find that reference books have no standard reasons or cures for *Cryptocoryne* disease. I have kept several different species of *Cryptos* in the past and I've noticed that when *Cryptocoryne* disease starts, it is due to an alteration of the conditions in the aquarium. I have noted, with *Cryptocoryne* species, that: (a) *Cryptocoryne* disease starts when there is a change in the water conditions. A normal water change can start the disease off. If you pour new water over an under-gravel filter air outlet, and the temperature of the new water is cooler, *Crypto* disease can start. (b) Older, established *Cryptos* are more tolerant towards water changes. (c) New *Cryptos* do better if you let them float on the water surface of the aquarium for a week or longer, if possible, and remove all the decaying leaves, etc. before you plant the plants. (d) Once a *Crypto* is planted do not move it around the aquarium as plants take a long time to get established again. (e) If a *Crypto* gets an attack of disease, pull the plant out of the gravel. This is to make the water conditions the same for both the

Continued on page 39

Gymnocorymbus ternetzi black widow



THE QUETZAL CICHLID



IN the almost impenetrable mountain forests of Guatemala and Honduras, up to an altitude of 3,000 metres, lives the legendary quetzal. A bird belonging to the genus Trogones, it was revered as long ago as Aztec and Mayan times. In the period before Columbus—and indeed down to the present—its feathers were considered extremely valuable. Consequently, only the highly placed in the social order were allowed to wear a cluster of quetzal feathers as an adornment in their hair. The splendid plumage of the quetzal is characterized by a contrasting shimmer of pinkish-red and green. An Indian legend from Guatemala tells of the part quetzals had to play in the great battle of Quetzaltenango, in which the Indians fought bravely but in vain against the troops of their Spanish conquerors led by Pedro de Alvarado. After the Spaniards had massacred more than 30,000 Mayas, countless

By Peer Koppelaar—with photographs by Arend van den Nieuwenhuizen

quetzals dropped from the heavens and commenced a death-watch for the fallen. Their corpses were covered by their green plumage. But the blood of the Mayas saturated the feathers of the birds' undersides and ever since the plumage has remained red. Today the quetzal appears on the insignia of Guatemala and one of the country's coins bears its name.

If one is acquainted with the legend, it comes as no surprise that Loisel applied the name quetzal cichlid on seeing specimens of *Cichlasoma synspilum* in their brightest colours, given that these fish also are found in Guatemala. Their distribution stretches further, however, through Belize as far as Mexico. The species inhabits all

C. synspilum—juvenile greenish form



Juvenile (about 9 cm. long) cleaning a spawning place

kinds of water on the Caribbean side of these countries: lakes, clear fast-flowing rivers and streams and also muddy and almost stagnant waters.

The quetzal cichlid attains a length of 30 cm in very large

Continued on page 31

Aquarian Fishkeeping Exhibition '84



RESULTS

- Tableaux:** 1, Basingstoke; 2, Hendon; 3, Havant; 4, Mr. Andrews.
- Barbs:** 1, C. Tonna (Reading) *Barbus eastonii* 76½ pts.
- Characins:** 1, Mr. and Mrs. Robinson (Stretford) *Poecilia harrisoni* 82 pts.
- Cichlids:** 1, Derek Ford (Bracknell) *Melanochromis johanni* 90 pts.
- Anabantids:** 1, Peter Moyer (Houghton Regis) *Ctenopoma kingleyae* 79 pts.
- Egg-laying toothcarps:** 1, Maureen Hall (CMCG) *Cynolebias constanciae* 82 pts.
- A.O.S. Catfish:** 1, David Wright (CMCG) *Sturisoma panamense* 84½ pts.
- Aspidoras, Corydoras and Brochis:** 1, Peter Moyer (Houghton Regis) *Corydoras julii* 82 pts.
- Rasboras:** 1, I. Perrett *Rasbora urophthalma* 75 pts.
- Danios and WCMM:** 1, C. Tonna (Reading) *Brachydanio abolineatus* 80 pts.
- Loaches and Botlias:** 1, Simon Norris (Bracknell) *Botia hymenophysa* 78 pts.
- A.O.V. Tropical Egglayer:** 1, Pete Smith (Tongham) *Laubuca dadiborjori* 71½ pts.
- Guppies:** 1, Phil Traat (CMCG) *Poecilia reticulata* 73 pts.
- Swordtails:** 1, B. Hall (CMCG) Red sword
- Platys:** 1, Paul Armstrong (Bracknell) *Xip maculatus* 75 pts.
- Mollies:** 1, J. Tonna (Reading) *P. latipinna* 71 pts.
- A.O.V. Tropical Livebearer:** 1, Hugh Smith (SLAG) *Quintana arizonae* 81 pts.
- Pairs Tropical Egglayers:** 1, Peter Moyer (Houghton Regis) *Tilapia bustekofferi* 76 pts.
- Pairs Tropical Livebearers:** 1, Hugh Smith (SLAG) *Brachyrhaphis episcopi* 82 pts.
- Breeders Tropical Egglayers:** 1, Peter Moyer (Houghton Regis) *Cory. ornatus* 81 pts.
- Breeders Tropical Livebearers:** 1, Derek and Pat Lambert (SLAG) *Xip. xiphidium* 74 pts.
- Single-tail Goldfish:** 1, C. Simms (Reading) Goldfish 80 pts.
- Twintail Goldfish:** 1, John Hall (Calverley Fishkeepers) Twintail 77 pts.
- A.O.V. Coldwater:** 1, Roy Hart (Hounslow) *Netropis lutrensis* 80 pts.



An attractive prize-winning individual tableau entered by Mr Andrews



The Hendon and D.A.S. entry—an excellent example of an 'integrated' tableau in which fish and scenery complement each other

- A.V. Plant:** 1, Derek Ford (Bracknell) Amazon Sword 75 pts.
- Individual Furnished:** 1, Jean Ellis (Kingston) 76 pts.
- Society Furnished:** 1, Hendon A.S. 77 pts.
- Best Coldwater:** Roy Hart.
- Best Livebearer:** Hugh Smith
- Best Breeders:** Peter Moyer
- Best Fish in Show:** Derek Ford of Bracknell A.S.

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THE QUETZAL CICHLID

Continued from page 28

aquaria. In favourable conditions it will grow even larger, as can be seen in public aquaria. This means that even small specimens of *C. synspilum* belong in a roomy aquarium right from the start.

The coloration of *C. synspilum* is very variable. Reference books describe whitish specimens tinged with red along the edge of the body, brightly flecked ones in some of which an orange-red, in others yellowish-red predominates, and also specimens which have scales along the middle of the body which are bordered with black. In addition, nearly all forms have a black band along the upper and lower parts of the body. Close to the body the dorsal, caudal and anal fins have the same ground colour as the body itself, in most cases. Towards their extremities the fins may be almost colourless and transparent, milky-blue, goldish-green, goldish-red or goldish-yellow. Unfortunately, this is not always evident in younger specimens. Sometimes they are predominantly greyish in colour, sometimes they bear quite intensive markings. I recently saw some fish of about seven centimetres in length which were already orange-red. Nowadays we know that these colour forms represent different geographical races. This is hardly surprising given the wide distribution of *C. synspilum*. The same degree of colour variation is also evident in a number of other central American cichlids.

Sexual differentiation is difficult in immature specimens. The sexes can be reliably distinguished only when two fish pair and spawn. If the sexual orifices differ in size and shape then one has a male and a female.

The fish are best kept in an

aquarium which is as large as possible. Half a dozen young fish should be accommodated in a 200 x 60 x 60 cm tank. This may seem rather large, but one must bear in mind that this cichlid grows very quickly and can soon become aggressive towards its fellows. Consequently, the company of other species should be provided. In addition, there must be sufficient room for the fish to form territories and swim about freely.

As quetzal cichlids eat a lot one must give them live food in the form of mosquito larvae, earthworms, Mysis and so on, but also deep-frozen food (mosquito larvae, Mysis, krill) and pieces of ox-heart. On no account should vegetable matter be omitted from the diet. This may consist of unwanted plants from other aquaria, lettuce, spinach or chicory and perhaps supplemented by dried food, for quetzal cichlids are plant-eaters by nature. Being fast-growing fish a lot of waste products are discharged into the water, of course. A biological filter of high capacity or a power filter of a size suited to the volume of the tank, along with regular partial water changes ensure that the water is not only healthy but crystal clear. Whether the water is hard or soft is not important, as long as one ensures that the pH value is neutral.

As companion fish in the quetzal cichlid tank a large number of cichlids are at our disposal. For example, *Cichlasoma nicaraguense*, *C. spilurum*, *C. nigrofasciatum*, *C. labiatum* or *C. salvini*, to name only a few. They need not be present in the same numbers as *C. synspilum*, for the latter should be the main tenants of the aquarium and should reproduce there. The other fish serve more as a "lightning conductor" for the increasing aggressiveness of the growing quetzal cichlids. Once the latter attain a size of about ten centimetres their coloration changes and the first signs of sexual maturity are recognizable.

Initially, courtship is very brief,

followed by a long rest period. Then it is recommenced, usually by the fish turning about each other at some distance above the tank bottom. Sometimes the fish move in tight circles and sometimes they move in wide circles about each other. From time to time the fish position themselves with the head on the tail of the other and one of the pair gently beats the other with its tail. After an interval the roles are reversed. Alternatively, the fish face each other, take hold of each other by the mouth and a violent bout of mouth-wrestling ensues. After this trial of strength several things may happen. Either a hectic chase follows, or the fish separate and one of them begins to clean a stone vigorously. In doing so the fish makes its relatively small mouth protrude and rasps away at the surface of the stone.

If the female is ready to spawn she stays near the male and there is no more attractive spectacle than their behaviour prior to the final spawning act. The splendour of their colours puts even the prettiest Malawi cichlid in the shade. Heijns described in August, 1982 how he put a male, which had recovered from damage sustained during transport, in a tank with a female. For safety's sake the fish were separated for a few weeks by means of a sheet of glass. "There was no cover in the tank, so that the fish were constantly in sight of each other. After a relatively short time intense sexual excitement was evident. After a few days I allowed them to meet. As soon as the glass was removed I witnessed mouth-wrestling such as I had never seen before. It lasted for one and a half hours. After they realized they were equal in strength the struggle was abandoned and the fish began to shake their heads and circle about each other, which is as much a part of spawning behaviour as the cleaning of a stone. Now their coloration was at its most impressive. Courtship and preparatory cleaning lasted

A phase of fighting behaviour

for three days. Then the first clutch of eggs was both a surprise and a source of suspicion. After the eggs had been extruded the male continued to shake his head and clean. After two days the eggs were covered in fungus. I assumed that the male had not fertilised the eggs properly. The second batch of eggs appeared after a week, but this time they were produced by the supposed male fish. . . . Now it was obvious: my beautiful pair consisted of two females."

Later Heijns told of a "proper" pair which produced more than



Juveniles mouth fighting



a thousand eggs. For a number of reasons some of the eggs were attacked by fungus, but he subsequently inherited some two hundred young. Eggs which are beset by fungus are most often produced by young pairs which have spawned for the first time. This gives rise to the suspicion that the male is not yet able to fertilise the eggs properly. At a temperature of 24°C the young hatch out after about seventy-two hours. Five to six days later they are free-swimming and can be fed with brine shrimp nauplii. Given their rapid rate of growth the young fish are soon fed with small water-fleas and chopped *Tubifex*, before being gradually put onto mosquito larvae, whole *Tubifex*, larger water-fleas, chopped ox-heart and dried food. All of it disappears quickly into the fish to re-emerge suspended in the water. Partial water changes are necessary to stop the water quality from deteriorating. Because of the rapid growth rate and the large number of young, several rearing tanks are needed into which the fish can be separated.

A beautiful pair of adult Quetzal Cichlids

the SCOTTISH AQUARIST FESTIVAL 1984

The eleventh Scottish Aquarist Festival took place from Friday 24 (Judging) to Sunday 27 May at its usual venue, the Civic Hall in Motherwell.

This friendly, well-organised Festival always attracts visitors from far and wide, including London and the southwest of England. This year was no exception, despite strong competition from the Scotland v England football international at Hampden Park on the Saturday and the glorious Bank Holiday weekend weather.

The 1984 Festival took place about one month later than normal, a move that was welcomed by most visitors, particularly those who travel hundreds of miles on this annual, enjoyable pilgrimage. Plans are already underway to keep this later staging of the event next year and, knowing the thoroughness and professionalism with which the Committee approach their duties, it will not be long before we receive firm details of the dates for 1985.

There is always a great deal to enjoy at S.A.F. Leading companies always have their latest products available (often at attractive discount prices), there are books, plants, equipment, fish galore (ranging from rare species for the specialist to bread-and-butter ones for the not-so-specialist), shells, ornaments and much, much more. If you have never made the trip to Motherwell, make a note in your diary when next year's dates are announced in the *Aquarist & Pondkeeper*—you will not be disappointed.

If you have children and think that they may feel a little bit left out once they have visited the stands and marvelled at the original and attractive tableaux and countless fish on show, then you need not worry because there is always a programme of hilarious cartoons screened in the excellent theatre/auditorium.

For those looking for "a bit of culture," there is a programme of lectures, also in the theatre. This year's lecturers were Willie Harvey (General Fishkeeping), Keith Barraclough, President of Ornamental Fish International (Is the Aquarist an Endangered Species?) and yours truly (The Language of Fishes). I feel certain that I speak for all three lecturers in extending sincere thanks to the organisers for their tremendous assistance.

I would also like to extend sincere thanks on behalf of the *Aquarist & Pondkeeper* for the marvellous decanter and glasses (suitably inscribed to mark the celebration of our 60th anniversary) presented to us by the S.A.F. Committee. The gesture was deeply appreciated and we look forward to a continued, long and happy relationship with the Festival.

J. Dawes

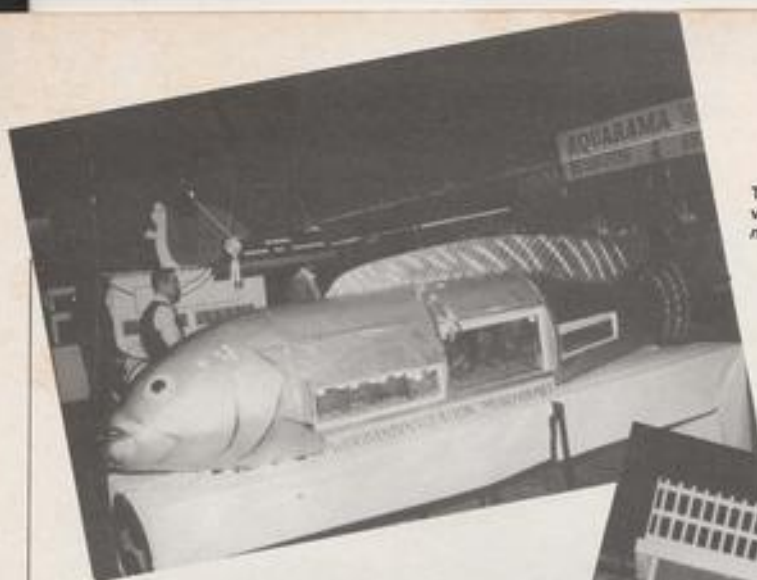
RESULTS

The Best Fish in Show was a magnificent *Moenhmannia copei* owned by E. and B. Calow of Bridgewater A.S. Top honours in the Tableaux section went to Muirhouse for their highly original fish, while the Society gaining the highest points by a long, long way was Dunfermline & District A.S. The 2nd-5th winners in the Tableaux Competition were: 2nd, Scottish A.S. (Railway Engine); 3rd, Greenock A.S. (Pigeon Loft); 4th, Bridgewater A.S. (Scottish Scene); 5th, Edinburgh Pondkeepers (Snooker Table).

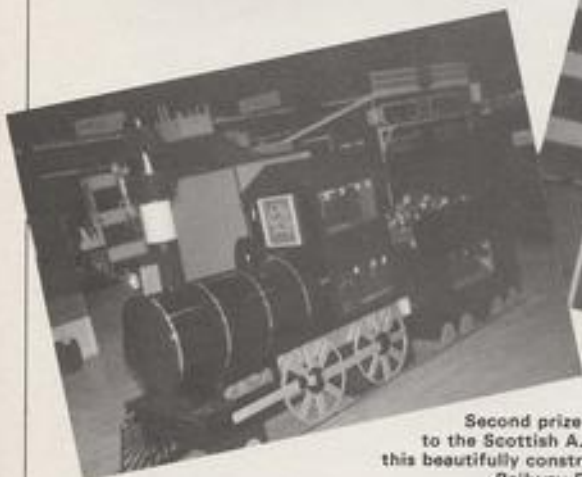
As usual, there were colourful and imaginative entries from Scottish schools. Prizes in this section included Abrohill (Nursery Class—up to 4½ years of age) and Lanark Primary VII (Primary Class—up to 12 years). The individual winner in the Schools Aquatic Art section was Lorna Cooper, aged 9, from Cambusnethan.

The full list of First Prize Winners is as follows:

Tropical Furnished Aquarium (Society)	Aberdeen A.S.
Coldwater Furnished Aquarium (Society)	Stirling A.S.
Tropical Furnished Aquarium (Individual)	H. Hoey (Dunfermline)
Coldwater Furnished Aquarium (Individual)	M. Dunbar (Paisley)
Marine Furnished Aquarium (Individual)	Mr. & Mrs. K. Robinson (Stretford)
Furnished Aquarium (School)	Cambusnethan Primary
Aquatic Art (Special)	Lanark Primary
Aquatic Art (Individual)	Lorna Cooper
Aquatic Art (Nursery)	Abrohill
Aquascape	Stirling A.S.
Common Goldfish & Comets	A. & E. Berry (Bridgewater)
Shubunkins	A. & E. Berry (Bridgewater)
A.O.S. Coldwater	A. & E. Berry (Bridgewater)
Guppies	N. Keay (Dunfermline)
Mollies	S. Graham (Muirhouse)
Platies	J. Wells (Dunfermline)
Swordtails	D. Loeg (Dunfermline)
A.O.S. Livebearers	R. MacIntosh (Muirhouse)
Any Species Livebearers (Pairs)	J. Wells (Dunfermline)
Guppies (Pairs)	J. Wells (Dunfermline)
Barbs 'A'	H. Hoey (Dunfermline)
Barbs 'B'	J. Melvin (S.M.T.)
Barbs, any variety (Pairs)	D. Dobbie (Dunfermline)
Characins 'A'	D. Dobbie (Dunfermline)
Characins 'B'	E. & B. Calow (Bridgewater)
Characins 'C'	K. Buckley (Bridgewater)
Characins, A.V. (Pairs)	K. Buckley (Bridgewater)
Rasboras	K. Buckley (Bridgewater)
Danios & Tropical Minnows	T. Boyle (Clyde)



The winner in the tableaux section was this Woodandinsulation muirhouse from Muirhouse A.S.



Second prize went to the Scottish A.S. for this beautifully constructed Railway Engine



These Pigeons carried home the third award for Greenock A.S.

Egg laying Toothcarps
Rasboras, Danios, Tropical
Minnows & Egg laying
Toothcarps (Pairs)

Siamese Fighters
Gouramis
Gouramis (Pairs)
Cichlid—Rift Valley
Cichlids—Dwarf
Cichlids—Large
Cichlids, A.V. (Pairs)
Catfish 'A'
Catfish 'B'

Catfish (Pairs)
Sharks

D. Long (Dunfermline)

J. Wells (Dunfermline)
C. Henry (Dunfermline)
K. Clark (Dalkeith)
K. Buckley (Bridgewater)
I. Bird (Dalkeith)
J. Fettes (Aberdeen)
J. Harvey (Scottish)
A. Hunter (Clyde)
D. Strachan (Aberdeen)
Mr. & Mrs. K. Robinson
(Stretford)
Y. & B. Downie (Dalkeith)
J. Wells (Dunfermline)

Loaches

Egg layers A.O.S.
Egg layers A.O.S. (Pairs)
Aquarium Plants
Breeders—Guppies
Breeders—Mollies
Breeders—Swordtails
Breeders—Platies
Breeders—A.O.S.
Livebearers
Breeders—Egg layers 'A'
Breeders—Egg layers 'B'
Breeders—Egg layers 'C'
Breeders—Egg layers 'D'
Breeders—Coldwater

H. Hoey (Dunfermline)
D. Long (Dunfermline)
T. Boyle (Clyde)
J. Kilmartin (Cumbernauld)
D. McLean (Cumbernauld)
J. Wells (Dunfermline)
J. McLees (Greenock)
J. Milligan (Edinburgh)

K. Buckley (Bridgewater)
W. O'Brien (Clyde)
K. Buckley (Bridgewater)
B. Reid (Cumbernauld)
W. O'Brien (Clyde)
M. Kyle (Dalkeith)

the SCOTTISH AQUARIST FESTIVAL 1984

Dave Strachan receiving his award from Dave Wilson (S.A.F. President) and John Young, our Advertisement Manager



Edinburgh Pondkeepers were right on cue to pick up fifth prize in the tableaux section with this Snooker Table



Robert Bell, the S.A.F. custodian of trophies working behind the scenes with the two S.A.F. engravers

Company Profile

The Highgate Aquarist



The Highgate Aquarist's premises in Archway Road, London

Question: What do all the following have in common: Greater London Council, The Zoological Society of London, Hughie Green, British Gas, The Coca Cola Corporation, BP International, King Khaled, Chelsea School of Art, The Wellcome Foundation, Mavis Nicholson, David Bailey, David Montgomery and Sheikh Mohammed of Dubai?

Answer: They have all bought fish from The Highgate Aquarist.

The above list, impressive as it is, represents only a selection of Eberhard Schultze's clientele who have spent as much as £1,250 on an adult pair of Turquoise x Red Discus. However, before you start thinking that

keeping Discus is only for the select few, you may be reassured to know that prices start modestly at around £3.50 for fish aged between 8 and 10 weeks and measuring about the size of a 10p coin. Given adequate care, these fish will soon grow and appreciate in value as they do so. Therefore, within a relatively short time, you can end up with a tankful of fish worth a great deal of money.

In spite of this, it is well worth discussing things thoroughly with an experienced Discus keeper before embarking on this specialised branch of fishkeeping. An excellent choice would be Eberhard Schultze himself who is, not only extremely knowledgeable

about Discus, but who will also actually discourage you from going over the top and splashing out unnecessarily on superb, but expensive fish which could end up as glorious, but expensive mistakes.

If you are, therefore, taking up Discus keeping, a visit to The Highgate Aquarist is likely to end up with you buying small (1½-2½ in.) Brown Discus, *Symphysodon aequifasciata axelrodi*, at around £4.50, or 2½-3½ in. Heckel Discus, *S. discus*, at around £16 rather than a breeding pair of tank-reared/developed Wattle's Turquoise Discus at £500+!

To put the record straight (or nearly so), the main types of naturally-occurring Discus are:

Heckel Discus—*S. discus*.

Green Spotted Discus—*S. aequifasciata aequifasciata*.

Blue Discus—*S. aequifasciata haraldi*.

Brown Discus—*S. aequifasciata axelrodi*.

In addition, there are quite a few man-made varieties, such as those developed by Dr. Schmidt-Focke and Reinhold Kurth of West Germany, which are exclusive to The Highgate Aquarist.

All the above, plus others, are regularly available at the shop in a range of prices and sizes guaranteed by Eberhard Schultze's overseas suppliers. Cultivated varieties come directly from West Germany or Holland while wild-caught specimens are supplied by renowned exporters, such as Adolf Schwartz from Manaus (son of the legendary Willy Schwartz) and Ivan Colorado of Bogotá.

The other side of the coin is that The Highgate Aquarist actually exports fish to many countries, including France, Italy, Norway, Sweden, Finland, Austria, Greece, Yugoslavia, Turkey, Canada, West Indies, India, Iran, Hong Kong, Philippines, Thailand and (even!) Singapore. Amazing though it may seem, wild-caught Blue Discus have actually been exported to Rio de Janeiro in Brazil by The Highgate Aquarist.

Another popular export is Eberhard's

Rechargeable Two-Column Deioniser which has in-built colour indicating resins specially designed for tropical tanks. This invaluable aid to Discus keeping was developed by The Highgate Aquarist and is sold (in addition to UK) in Saudi Arabia, Thailand, France, India, West Indies, Canary Islands, Japan and Turkey.

Other noteworthy landmarks in The Highgate Aquarist's ten-year history include the first-ever importations of Colombian Green Discus and Onion Plants (*Crisium thaisianum*).

From the outset, in 1974, Eberhard Schultze has run what he calls a Rail-a-Discus service. This means that hobbyists do not necessarily have to visit the shop to obtain their fish. The whole deal can be done over the 'phone, after which each Discus is individually packed in oxygen-filled polythene bags, placed in heat-retaining boxes and dispatched by British Rail or Airline on Mondays (Bank Holidays excluded). There is a handling charge of £5 for this service which also includes either a telegram or 'phone call giving details

of arrival. Further, live arrival of the fish is also guaranteed.

One of the fundamental factors allowing The Highgate Aquarist to guarantee live delivery is that every fish offered has been previously quarantined for three weeks in water having a pH of between 5.2 and 6.2 and a hardness of 6° to 8° DH. Fish are only offered for sale if they are known to be free of parasites and have been feeding regularly.

Although it is true to say that the business revolves around Discus, other fish are also offered for sale. Needless to say, they are all in peak condition, receiving water treated as thoroughly as the Discus themselves.

Part of the treatment includes the use of an Oxydator in each tank. This amazing piece of apparatus, developed in West Germany, is designed to increase the amount of available oxygen dramatically, reportedly stabilizing and purifying the water to such an extent that aerators, biological filters and ozonisers (in the case of marine aquaria) become superfluous.



A fine pearl discus photographed at the Highgate Aquarist

Other exclusive Agencies held by The Highgate Aquarist are Optima (sometimes referred to as the 'Kidney Machine' for aquaria), Brustmann (remedies and aids) and Bischof (electronic equipment, including pH and conductivity meters).

If you would like further details, please contact Eberhard Schultze at The Highgate Aquarist, 367A Archway Road, London N6 4EJ. Tel: 01-340 7766.

What is Your Opinion? — Continued from page 27

roots and the leaves. Remove the decaying leaves, etc. and let the plant float on the surface of the water till new leaves start to appear. Replant the Crypto when it recovers. I hope my observations may be of some use to your readers. P.S. Can you send me the name of a good reference book that will cover *Cryptocoryne* species, etc.? I enclose a s.a.e."

I found your comments most interesting, Mr. Mills. I've published my theories about leaf-loss in *Cryptocoryne* species many times before. I have a variety of reference books, that I've bought over the years, about aquatic plants. Many of the older ones are well out of date. The names of some plants are changed as classification improves. I'd recommend *The Complete Guide to Water Plants*, by Helmut Muhlberg, published by E. P. Publishing Ltd. (German edition (C) 1980; English edition (C) 1982).

Another good reference book is *Aquarium Plants—their Identification, Cultivation and Ecology*, by Karel Rataj and Thomas J. Horemán, published in 1977 by T.F.H. Publications, Inc. Ltd. Of the two, I'd prefer the former, with 109 coloured and 112 monochrome photographs of plants, plus 59 illustrations. No reference book about plants or animals is perfect because of new discoveries and changes in names. It's useful to keep up to date by taking a regular, monthly magazine such as *The Aquarist*.

For next month—when we'll be celebrating our Diamond Jubilee—please send me your opinions on any of the following: (a) breeding the black widow tetra, *Gymnocorymbus ternetzi* (Photo 3); (b) cultivating *Cryptocoryne* species; (c) aquarium shows and public aquaria that you've visited this summer; (d) feeding Oscars; (e) water chemistry—pH and hardness—and its effect

on aquatic plant growth; (g) fish houses; and (h) your favourite aquarium book. I look forward to hearing from you on time to mark our 60th year in the aquarium magazine business. Hope you've had a super summer. It's still raining here!

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Thalassoma kribia

SPOTLIGHT

Powder Blue Grouper

Specific name: *Epinephelus flavocaeruleus*
Size: 18 inches

by Martyn Haywood

THE groupers or sea basses are a huge group, with species found throughout the world's seas. As such it provides many fish of interest to marine aquarists and one of the foremost among these is the Powder Blue Grouper.

This species is found throughout the tropical Indo-Pacific region but most of those which reach British shops originate in Sri Lanka. There they set up territories in coral and rock caves, usually below a depth of 20 feet. When frightened they quickly retreat into the inner recesses and so are difficult fish to catch for the native divers, the majority of whom do not use aqualungs. Because of this the supply is never sufficient to meet the demand and this is reflected in the price they command. Nevertheless, there is a steady stream of big-fish fanciers who snap them up.

The Powder Blue grouper, while not one of the giants of the family, reaches a respectable 18 inches long and makes an impressive specimen. Some of the really big fellows can reach over eight feet long and weigh over 1,000lb. *E. flavocaeruleus* is usually offered for sale between three and six inches long but they are rapid growers, quickly putting on both length and depth and really need a 50 gallon or bigger tank to do them justice.

The youngsters are often rather shy and retiring, frequently cowering in the back corner of the shop sales tank and only appearing for a split second to grab food before returning to their retreats.

Also, when frightened their colours lose their intensity, the body turning a dull slate blue-grey and the fins light lemon. It is not until they are in the more settled environment of the home aquarium that they really come into their own.

Given even moderately good water conditions, a suitably sized cave and not too intense a level of lighting, the Powder Blue soon settles down and comes to justify its common name. The body colour varies from a rich cobalt blue to a deeper shade, just short of royal blue. The contrast with all the fins, which are a bright lemon to butter yellow, is quite striking and makes this one of the most vividly coloured of the larger groupers.

In addition the Powder Blue has those qualities which elevate it beyond just a fish in a tank to being a family pet. From an initial shy and retiring stage it soon becomes the king of the tank, prowling regally in and out of the rockwork, ever on the lookout for food. Within a very short time they come to recognise their feeder and will expect food everytime he walks past the tank. This they will take eagerly from their owner's fingers.

Suitable foods are anything big and meaty but they prefer whole fish and shrimps, which should be gamma ray irradiated before use, to prevent introducing disease to the tank, although Powder Blues seem very disease resistant. Small food items should not be offered as much will be ignored and may

cause pollution within the tank. Smaller fish such as damsels cannot be kept to eat these particles as they themselves will be regarded as food. Probably the best scavengers for grouper tanks are hermit crabs although even these heavily armoured animals will sometimes receive unwelcome attention. Because of this healthy appetite a great deal of waste matter results and so it is vital to have an efficient filter system for the tank. If properly cared for Powder Blue Groupers can be expected to live for at least seven or eight years by which time they have usually outgrown most people's tanks and been donated to public aquaria.

If the thought of an eighteen inch grouper is too much then consider the plight of those aquarists who unwittingly buy the beautiful black and yellow Tiger Grouper, *Promicrops lanceolatus*. This fish is regularly seen at between four and six inches in length but it is one of the true giants of the family. Adults, which can live for many decades, may reach ten feet long and have been accused, but never convicted, of swallowing divers. Not a fish to be taken on lightly.

In contrast there are many dwarf groupers which are vividly coloured and do not grow much beyond four inches long. Among these are the Grammas from the Caribbean and the *Pseudochromis* species of the Indo-Pacific. Like their bigger cousins these are hardy, easily kept fishes but they can be safely housed with the other smaller fish, such as clowns and damsels, to make an interesting and attractive community.

Tomorrow's AQUARIST



EXHIBITION REPORT By Jonathan Moss



We have received the following unsolicited "report" from 14-year-old Jonathan Moss of 43 Circus Road, St. John's Wood, London, NW8, on his visit to the Aquarian Fishkeeping Exhibition '84 with a suggestion that it might be suitable for inclusion in 'Tomorrow's Aquarist'.

Jonathan is a pupil at St. Paul's School in London where he has been involved in starting up an Aquarium Society. He has been interested in fishkeeping "for some time now" and

currently has a community tank at home.

"On a hot June morning, I travelled from Central London to the 'Aquarian Fishkeeping Exhibition '84' at Kempton Park Racecourse.

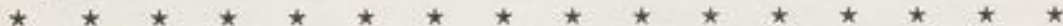
Having paid my 50p Children's Fee, I was welcomed by an official urging me to buy the Exhibition's Catalogue. After handing over my 50p, I stumbled across a basket containing an endless supply of free tubs of tropical fish food. Moving on, I feasted my eyes on a spectacular sight—a tank swarming with Piranha fish, with a replica of a human skeleton sitting in the corner.

Walking leisurely on, I kept a watchful eye out for the unusual and prizewinning fish, of which there were many. However, the fish were not always the centre of attraction, for, sometimes, it was the display tanks which were amusing and creative. Among them, was a small bus, which when you looked through the windows, various types of fish could be seen. There was also a selection of

houses which contained various colourful species.

I paid visits to the stands of the leading names in aquariums, aquarium care and accessories, to the *Aquarist & Pondkeeper's* stand, where a large selection of fish literature and back issues of the magazine were on sale, and to the specialist societies. The societies present were: the British Killifish Association, the Catfish Association of Great Britain, the Anabantoid Association of Great Britain and the Southern Livebearers Aquatic Group. These were of great interest to me as I have not a good knowledge of specific breeds.

After walking around the exhibition twice, it was time to go. On leaving, I took more samples of fish food which will certainly help my economic situation. I had had a very enjoyable time and I returned home with an ornament for my own aquarium and two books on fishes for the community tank, as well as numerous leaflets and free samples of fish food.

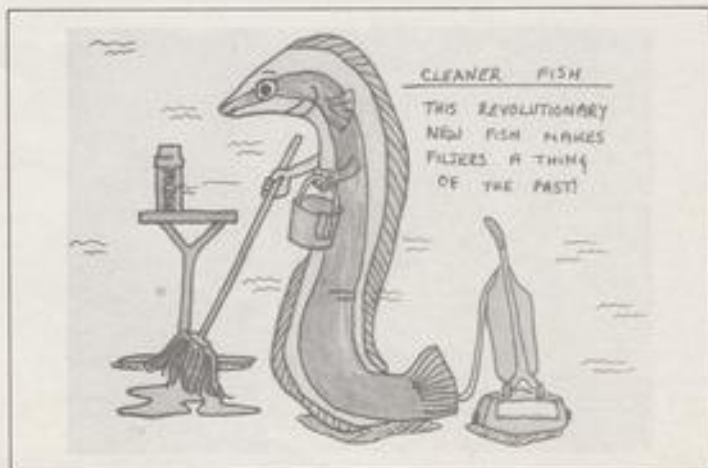


FUN-FISH WINNER

This month's winner is 16-year-old Rory Stormouth-Darling of 2 Grove End Road, London NW8. Rory's prize consists of six months' free subscription to the *Aquarist & Pondkeeper*. If you think that Rory's entry is good, you should have seen it in colour as we did—it was fantastic.

The quality of entries that we are receiving is exceptionally high and your support is most encouraging indeed. Keep them coming!

SEND YOUR ENTRIES TO:—
THE CONSULTANT EDITOR
(FUN-FISH COMPETITION)
AQUARIST AND PONDKEEPER



THE CONSTRUCTION OF AN ECONOMIC FISH HOUSE

By Dr Peter A. Lewis, PhD

Part 6 **SHELVING**
illustrated by the author

OVER the preceding five articles of this series we have seen how to construct a place in which to keep our fishy charges starting first of all from a "green field site", where nothing stood prior to beginning the project, and progressing through to the fifth article which fully discussed the use of an existing structure after relatively minor alterations. What I would like to do now is to discuss, with the aid of illustrations, how to furnish the fish house with the requisite shelving and to include the construction and management of a "fish house pool" built within the shelving area to house immature fish that are being conditioned for breeding etc.

As mentioned in an earlier article there are two basic materials from which the hobbyist can construct his shelving on which will stand the tanks. The first and most difficult material to work with is mild steel angle iron which can be cut and bolted or welded together to make a very strong and durable support system for the tanks, particularly if the iron is embedded in the walls of the fish house during construction. Many colleagues of mine have used angle iron most successfully in the construction of shelves but, with very few exceptions, these people have had prior experience in the art of welding. Since I have never used angle iron for shelving nor have I any experience in welding I do not feel qualified in elaborating further on the use of angle iron. Suffice it to say that such material can be used most effectively

and that in every case where I have seen it used the iron has been given a very generous coating of a corrosion inhibiting paint such as those paints based on aluminium. Without exception my chosen material of construction has been wood, either new or recovered. Using either a skeleton of 4 in. x 2 in. uprights with 3 in. x 2 in. horizontals and cross members as shown in *Figure 4*, or using a partially filled structure as shown in *Figure 3*, a strong and warp resistant bay of shelves can easily be constructed in the space of a weekend.

Basically the materials required are several 8 ft. lengths of 4 in. x 2 in. and 3 in. x 2 in. timber, one sheet of $\frac{1}{2}$ in. thick exterior grade plywood, 2-3 pounds of nails, either galvanised steel or aluminium and perhaps a gross of 1 in. No. 8 countersunk brass, stainless steel or galvanised wood screws. For a structure as illustrated in *Figure 4* then the $\frac{1}{2}$ in. plywood can be dispensed with and instead we will require 18 in. x 4 in. bolts and 36 in. x 6 in. bolts with appropriate nuts for each bank containing three shelves. Purchase of the timber in 8 ft. lengths will minimise the amount of sawing required if the fish house can accommodate a "standard" 8 ft. long, 6 ft. 6 in. high and 12, 15, 18, 21 or 24 in. deep bay for tanks. The use of exterior grade plywood, rot resistant timber and corrosion resistant hardware will cost slightly more initially but will pay back over time in that the structure will not start to show unsightly rust stains or mildew marks nor will the

plywood begin to delaminate as soon as the inevitable spill soaks into the ply and destroys the glue bond. Remember, prepare for the worst and then when it happens the damage to both your bank account and your morale is never as great as if you were totally unprepared.

Assuming the wall of the fish house along which we are to construct our bay for tanks is 9 ft. long, after allowing for a $3\frac{1}{2}$ in. insulated core in the inside of the fish house this gives a free available run of 8 ft. 5 in. If the available shelf space within the bay is an even 8 ft. and 2 in. x 4 in. timber is used for the vertical supports, then the finished bay will have an overall dimension of 8 ft. 3 in. leaving a clearance of 1 in. on either side of the fish house walls. For all practical purposes this clearance can be reduced considerably but in working with finer clearances all measurements will have to be made within very close tolerances and the walls will have to be checked to ensure that they truly are as square as they look. It is not uncommon, particularly in an older house, for a wall to "lose" an inch when measured from corner to corner as compared to the same measurement made 2 ft. out of the corner across the same wall.

Figure 1 illustrates what I consider to be the basic framing arrangement for a bay of tanks. First decide how deep you want the shelves to be when measured from front to back. This is most critical as this measurement predicates how wide the tanks will be that are intended for this bay. It is pointless making shelves 15 in. deep and then only placing a 12 in. tank on the shelf, furthermore it is dangerous to try the converse and place an 18 in. tank on a 15 in. shelf. If you plan to make all glass tanks yourself then the choice of shelf width is entirely at your discretion since you are the master of the situation. If, however you intend to buy commercially available tanks to sit on your shelves then first check up with your intended supplier to make sure that the width of tank you require is a stock item rather than a made-to-order special. Invariably a made-to-order job costs more and has to be

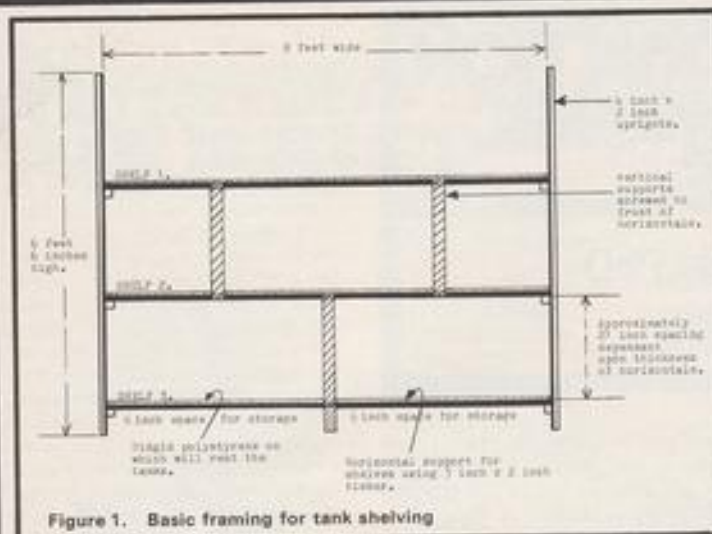


Figure 1. Basic framing for tank shelving

paid for 'up-front', sight unseen. Additionally you may want to consider just how large a volume tank that you really need since the price of tanks raises dramatically at critical points when the volume of water held becomes so great as to require the use of quarter in. plate glass or, costlier still the use of half in. plate glass. Think also about the surface area exposed to your view when planning the tank set up prior to making the bays. If a 24 in. x 15 in. x 12 in. tank is placed on a 24 in. deep bay such that your view of the tank is through the 12 in. x 15 in. 'window,' then will this meet your needs for viewing that tank? If you intend to breed or rear young in the tank then the likelihood is that the positioning of the tank will be satisfactory since it will afford both young and breeding pairs some refuge and security when they retreat to the back of the tank. If, on the other hand, you want to set up a series of photography tanks or display tanks then you would find this type of arrangement most frustrating and end up wishing that you had placed the 24 in. x 15 in. x 12 in. tank on a bay 12 in. deep such that your "window" now becomes a clearer 24 in. x 15 in.

So, having dispensed with the decision making process, let us assume that we have settled on making the bay

of shelves 18 ins. deep for this project. If the wall against which the shelves will stand has no projections then the bay can be made exactly square with an overall width of 18 ins. Should projections be in the way, however, we must either allow for them during the construction of the shelves or in the placing of the tanks. First cut 4 lengths of 4 in. x 2 in. timber to the required height, 6 ft. 6 in. in the example shown as Figure 1. Then mark off on each length the position of the shelf support. In the example shown there is a 6 in. gap between the floor and the bottom of the shelf, a space which I always designate for the storage of my white worm cultures. Between the top of shelf three and the bottom of shelf two is a gap of 21 ins., this will readily accommodate a tank that is 15 ins. deep and yet still leave ample access to the tank as well as allow a fluorescent light fixture to be located at the back of the shelf. Allowing a similar gap of 21 in. between shelf two and shelf one will then result in a top shelf having a space of from 22 in. to 24 in. dependant upon the height of the shed and the thickness of the rigid polystyrene placed under each tank. In my own experience a gap between the top of the tank and the bottom of the shelf above of less than 6 ins.

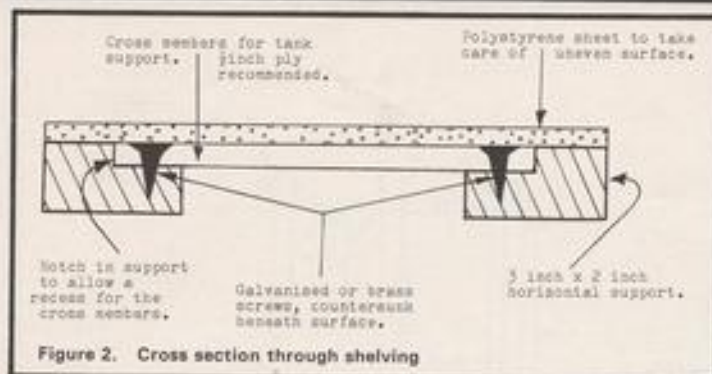
is impracticable. Remember, the fish we put in our tanks are likely to grow in the tanks and it is no good having a working gap that just enables a 4 in. Oscar to be placed through the gap into the tank. Imagine trying to get this same fish out of the tank a year or two later when the fish has grown to a magnificent 12 ins. long.

Having marked off the shelf location on the uprights next join the two pairs of uprights together along the marked lines using six 18 in. lengths of 3 in. x 2 in. timber either firmly screwed or bolted to the uprights. Now comes a part for which a power saw, a table saw or a friendly timber merchant is required. We must now select six straight 8 ft. lengths of 3 in. x 2 in. timber and cut a rebate out of each length across the 3 in. face to a depth equal to the thickness of the plywood purchased for the cross members of the shelves. These six lengths of timber can now be nailed, screwed or bolted to the supports fitted to the four uprights thus forming our framework for the shelves.

The next sequence involves cutting up the sheet of 8 ft. x 4 ft., 1/2 in. plywood into strips 6 in. wide and 18 in. long. If the sheet is first cut into two pieces, one at 3 ft. x 8 ft. and the other 1 ft. x 8 ft. then these two sheets can be further divided to give a total of 42 lengths approximately 6 in. wide by 18 in. long after allowing for the kerf of the saw cut. Each of these lengths of plywood can then be drilled, countersunk and screwed into the rebated horizontal timbers as detailed in Figure 2. We have now made a sturdy shelving bay capable of supporting the necessary tonnage of water in which we will house our fish.

The next step involves anchoring the bay to the fish house wall. As constructed the bay is free standing and flush at both the back and the front. This makes for easy installation as all that is required is for the hobbyist to manhandle the structure carefully into position and then to anchor the framework to the wall using steel or aluminium brackets or by drilling and plugging the wall and screwing coach bolts through the horizontal 2 x 3's into the plugged holes.

We are now ready at this stage to



actually start to place the tanks on the shelving. My practice has always been to place empty tanks on the bottom shelf first and move them into different positions on the shelf if they are of unsymmetrical lengths. Once I am fully satisfied with the positioning of each tank I will then screw an appropriately sized length of 2 in. x 1 1/2 in. timber from the floor to the top of shelf two attaching the support to the front of both shelf two and shelf three. The positioning of this additional vertical support is critical since, once screwed into position, the tanks on shelf three are effectively locked into place. This piece should also never be nailed or glued into place since it may need to be removed at some future time and the screws will facilitate this. This exercise is repeated with the addition of extra vertical supports between shelves two and one as illustrated in Figure 1. Remember, as mentioned earlier, to place a sheet of half inch rigid polystyrene on each shelf prior to setting the tanks in place.

Many permutations and combinations of tanks can be located on our 8 ft. x 6 1/2 ft. x 18 in. deep structure with little fear of the structure warping or collapsing. In my own experience it has always worked out best to have the tanks intended for breeding pairs located on the uppermost shelf. Generally fish in this location are not as readily startled by sudden movement and, additionally, they are observed more comfortably and photographed more easily than those residents of the lower tanks.

An addition to the front of the lower shelf that can be made dependant upon the drainage system available is the incorporation of a section of PVC guttering into which the dirty tank water can be drained and from which this discarded water is routed to any of the types of drainage system as described in the earlier articles in this series. One refinement to this gutter

that I have always included in my project is the addition of a small metal pipe clip into which I could firmly locate the drain end of my plastic siphon tube. This very minor modification was made only after I had been through the experience of the siphon line dropping out of the gutter onto the floor of the fish house and discharging gallons of dirty water onto the floor before it was noticed. One of the inevitable spillages I mentioned earlier that was bound to happen.

An alternative and perhaps less time consuming method of shelf frame construction is that illustrated in Figure 4. Here there are no plywood cross members and the horizontal framing is not rebated. The whole frame is comprised of lengths of 2 in. x 4 in. timber uprights bolted firmly together with 2 in. x 3 in. cross supports and horizontal framing. The uprights are bolted to the horizontal supports using six 4 in. bolts threaded through previously drilled and carefully aligned holes. The cross sup-

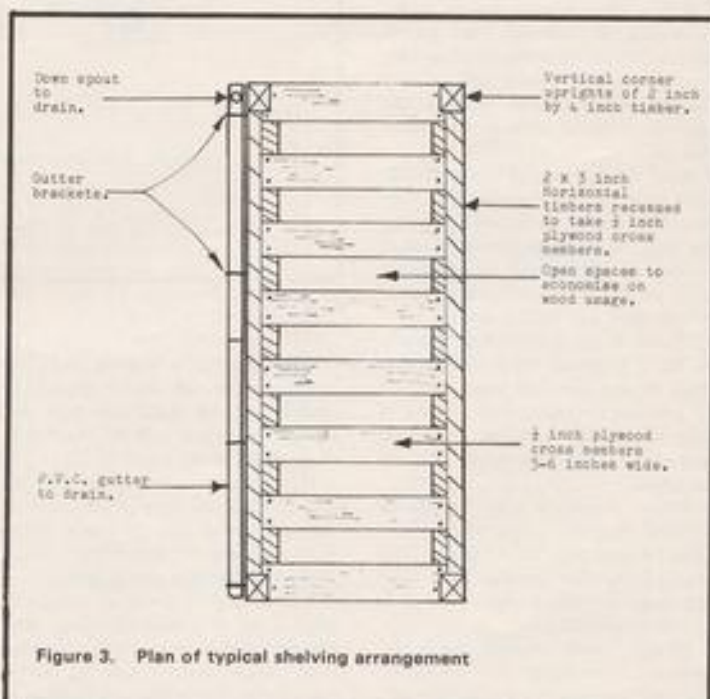


Figure 3. Plan of typical shelving arrangement

ports are bolted to the horizontals using 12, 6 in. bolts per shelf, again making sure that the holes are carefully aligned so that the structure remains square and self supporting. Addition of the central horizontal timber as shown in Figure 4 is almost obligatory if the depth of the shelf is to be more than 12 ins. Once again rigid polystyrene is placed along each of the horizontal supports to take up minor inequalities in the wood. This type of structure is not flush at the back and front which can cause minor problems when it comes to anchoring the structure. The structure is, however, excellent as an island structure down the centre of a large fish house which already has shelving around the walls.

The structure illustrated is free standing, robust and easily accessible from either side and may be slightly cheaper than that illustrated in Figures 2 and 3 dependant upon the cost of the rather long bolts required to complete the structure.

A few tips learned from my own experiences:

If you do not wish to use brass, galvanised or stainless steel screws then an acceptable alternative is to fully countersink each screw and to seal the countersunk hole with simple beeswax obtained from any furniture finisher.

Build the shelves and framing inside the structure for which they are intended. It is embarrassing, to say the least, to build an excellent set of shelves in the garage or workshop only to find that you cannot manhandle them into the fish house.

Finish all the woodworking projects in the fish house before introducing fish. Power saws and wood combine to produce a considerable volume of dust which will settle on everything and water-filled fish tanks are no exception.

When installing the additional vertical supports locate them at a point where two tanks meet. This makes for a tidier finish and also hides the sharp unfinished edge of the tanks out of harm's way.

Double check measurements repeatedly, remember the carpenter's maxim: "measure twice and cut once".

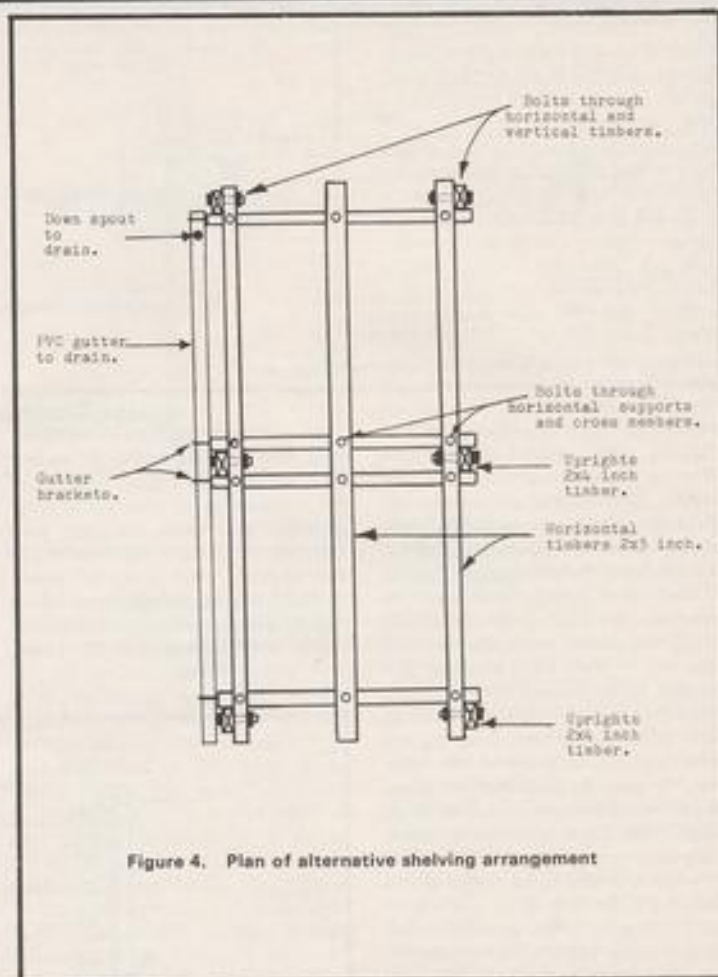


Figure 4. Plan of alternative shelving arrangement

The more trouble taken in the earlier stages of the fish house project to ensure that the walls and floor are square the easier will be the fitting of the bays of shelves.

If nails are used during the shelving project, only use rust proof finishing nails and make sure the heads of the nails are punched below the surface of the wood with a steel punch.

Use a long (1 metre is optimum) spirit level to constantly check that the shelving is truly level. Nothing looks worse than a row of neatly filled tanks where the water level is

gently sloping from one end of the row to the other. This step is best performed just prior to anchoring the framework to the wall such that any minor adjustments to level can be made by adding wood shims under the 'feet' of the uprights.

In many instances it is a good idea to add the lighting circuit before adding the tanks and final vertical supports. This is optional and really depends on the lighting required and the preference of the hobbyist for performing such a task under conditions of cramp and immobility. If

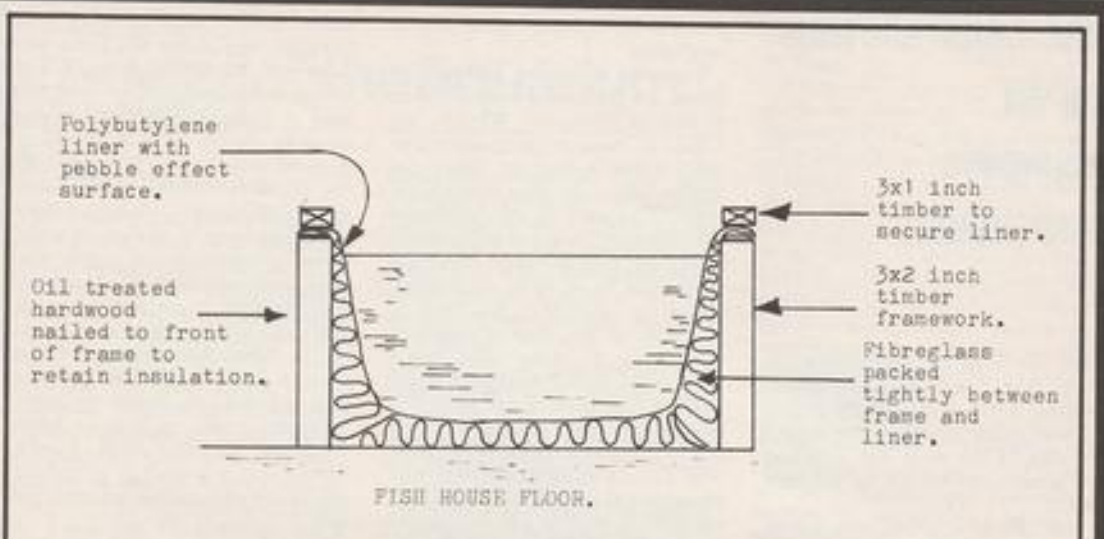


Figure 5b. Cross section through "fish house pool"

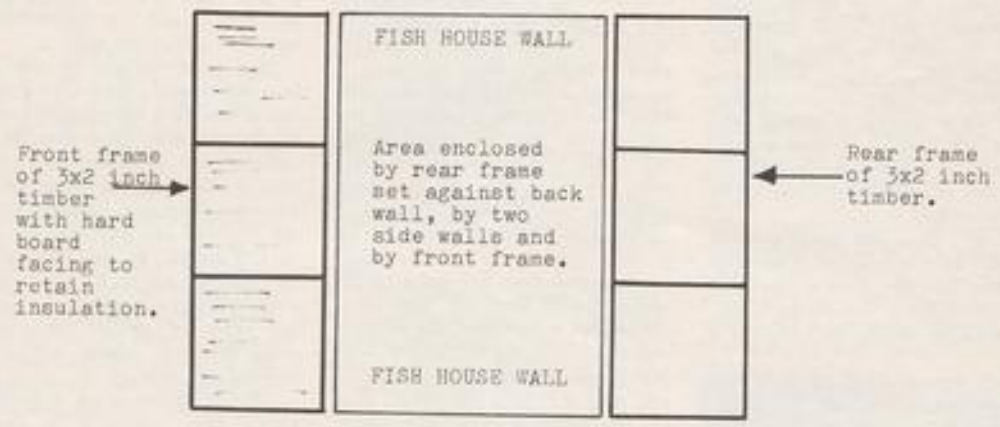


Figure 5a. Details of framework for "fish house pool"

THE CONSTRUCTION OF AN ECONOMIC FISH HOUSE

bolts are used for constructing the frame then it is a good idea to add washers to either side of the lengths of wood being joined to both protect the face of the wood and to spread the pressure exerted by the tightened bolt.

The use of a spaced arrangement for the cross supports as shown in *Figure 3* ensures that there is never any problem in feeding air lines or electrical wiring from one shelf to a higher or lower level.

I seem to have spent an inordinate amount of space going into great detail concerning the construction of shelving for our fish house project. In reality this serves to illustrate how critical and essential this part of the project can become. As I have said repeatedly, water will always be heavy and wet and glass will always be fragile and expensive, therefore it is most certainly worth the time spent in making safe, strong tank shelving as some attempt to make up for the inadequacies of glass in combination with the cradle of aquatic life, water.

Before I close this month's article I would like to cover a type of construction that can take place at the same time that shelving bays are made and, indeed, is an integral part of such a bay.

Many hobbyists feel that they need a large tank, 60 gallons and larger, in which to keep fry and grow them on, either for sale at a future date or whilst selecting a few breeding pairs from fish purchased that were immature at the time of purchase. Such a large sized tank is ideal for these purposes but the cost of such tanks can be prohibitive. Here is where the use of a polybutylene pool

liner and a little ingenuity can pay off handsomely.

Start first by making two wooden frames out of 2 in. x 3 in. timber as detailed in *Figure 5a*. What we are trying to make is an inside "pool tank" using a wooden frame for support and a pool liner to retain the water. Construct the wooden frames to a convenient height for going underneath one bay of tanks. Generally a height of 15 or 18 in. is adequate. Locate one section of the frame at the back of the shelving bay and the other at the front. Next tack a sheet of oil treated hardboard to the front of the front frame after first making sure the hardboard is cut one inch deeper than the front frame. Now line the whole arrangement with fibreglass making sure that an adequate thickness is used to line the part of the frame area that encompasses the fish house floor. Then take a previously sized sheet of polybutylene and line the whole boxed in area with this liner taking care not to stretch the liner at any point. Thus we have constructed an indoor pool using the fish house walls as three of the pool walls and a wooden frame as the front wall. A pool as large as 8 ft. long, 2 ft. wide and 18 in. deep can readily be constructed under a 2 ft. wide bay of tanks. The liner is kept firmly in place by tacking a length of 3 in. x 1 in. timber across the front and back frames after first making sure that the edges of the liner are firmly tucked under this timber. *Figure 5b* illustrates this technique, which I have personally used to construct an indoor "growing on" pool with considerable success. I chose to use the polybutylene pool liner that has a pebble design printed onto the liner since this appears more natural and certainly seemed to make the fish appear more secure and colourful. My pool was 6 ft. long, 2 ft. wide and 15 in. deep and held a total of 90 gallons of water. I never placed any gravel in the pool but I did use a few rocks and flowerpots in the pool since the primary fish that I was breeding at the time were dwarf cichlids that needed some sort of caves and rockwork for shelter.

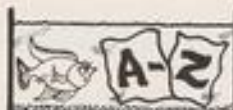
Two things of importance that need consideration before embarking on an

indoor pool project. First, the pool is on the floor of the fish house and water will have to be pumped out during cleaning operations since the head of water is likely to be inadequate for starting an effective siphon. A pump such as the "DynaFlo" with the discharge end run to drain can be used effectively. Second, the heating of the water in this set up needs special attention as we cannot just place a submersible heater in contact with the sides of the pool since this will result in a neat hole being burnt into the liner. Either place the heater securely inside a glass bottle in the pool such that the heater can never accidentally contact the liner, or insert the heater through a piece of polystyrene that will float in a confined area of the pool and never contact the side.

One advantage I have found from this set up is that the fish are observed from above and are less likely to be aware of the viewer's presence. Thus the fish seem to behave more naturally since they are less conscious of our presence. I have spent many hours seated alongside my indoor fish house pool amazed by the antics of a shoal of young kribensis as they began to playfully spar amongst their brothers and sisters and set up individual territories within the tank.

This month's article has taken the hobbyist through what is most likely one of the more rewarding aspects of fish house construction since, in my opinion, the structures take shape very quickly and the results of the effort are easily seen. Once complete the hobbyist can add his own flair of individuality to the shelving by, for example, giving them a coat of a bright alkyd based paint or by mounting paper or painted backgrounds along the wall against which the shelving will be anchored.

Addition of the necessary electrical supply lines and runs of air-line tubing is very straightforward with the types of projects described and will normally require no additional drilling of holes or the running of mounting boards. In the next article I will cover the addition of these two essentials to the fish house, the electrical main and the centralised air supply.



A-Z of the Aquarium

Ichthyboridae

THE Ichthyboridae form a Family of nine genera, none with numerous species, found in freshwater in Africa.

This last point is worth emphasising because the common name of, at least, one species (*Phago maculatus*), i.e. the Pike Characin, is shared by a South American fish (also known as the Cachorro), *Acestrohyncus cachorro*. However, according to the classification of Nelson (1976) and other authorities, such as Greenwood et al (1966), *A. cachorro* belongs to a separate Family, the Characidae, which includes all of the species commonly known as Characins.

As mentioned elsewhere in this series (A-Z, May 1983), the Characins form an extremely varied Family. Even so, *P. maculatus* is not a true Characin in the strict sense of the

word, despite its common name. It is, however, a Characoid (Superfamily Characoidea of the Suborder Characoidei). In this sense, therefore, it is related to the true Characins and shares several features with them, e.g. the presence of well-developed teeth and an adipose fin.

In addition, the Ichthyboridae have several characteristics which set them apart. For example, they have a movable premaxillary bone. Behaviourally, some are known to eat the scales and fins of other fish.

In some books, the Ichthyboridae are included in yet another Characoid Family, the Citharinidae, along with well-known species such as those belonging to the genera *Distichodus* and *Neolebias*. However, the characteristics referred to above are considered to be significant enough by most leading authorities to warrant the

separation of the Ichthyboridae from all others.

Despite their predatory habits and tough reputation, Ichthyborids are, reportedly, not easy to keep in aquaria. They can grow up to a size of around 8 in. (20 cm.), but can be rather timid, requiring adequate shelter in the form of caves and/or dense clumps of vegetation. *P. maculatus* has been reported as "a decidedly nasty fish which kills for the sheer pleasure of killing". While, perhaps, finding the anthropomorphic undertones of this statement somewhat difficult to accept, the fact remains that it does highlight a potentially serious drawback. Nevertheless, our state of knowledge of Ichthyborids is such that any successful attempt at keeping and (especially) breeding them in captivity is bound to provide new and significant data.



Phago maculatus, the "genuine" pike characin

Jacks



Gnathodon speciosus

JACKS, also known as Pompanos, belong to the Family Carangidae. The vast majority of Carangids are marine (a few are brackish) fish found in the Atlantic, Indian and Pacific Oceans. Although there are about 24 genera with a total of around 200 species, very few are ever seen in aquaria.

The Carangidae can be distinguished from other "naked" fish in that these seemingly scale-less areas occur in conjunction with one or more of the following characteristics: scales along the lateral line are often modified into spiny scutes; the anal fin usually has three spines, the first two of which are detached from the third; there may be detached finlets behind the dorsal and

anal fins; the caudal peduncle is slim; the caudal fin is widely forked.

In addition, many species are streamlined, have a large terminal mouth, and highly developed eyes.

Most combinations of the above features point to the Jacks being fast-swimming predators requiring a great deal of open water. Despite their predatory habits, some species are quite peaceful towards equally-sized fish and can be kept in home aquaria when young.

Of the "aquarium" species, one that is occasionally available is *Gnathodon speciosus*, the Barred Jack, which can grow up to 3 ft. or more in length (c. 90 cm.). This particular fish has, at least, two colour phases, juvenile and adult. Of these, the more attractive by far is, fortunately, the juvenile phase.

Like most other Jacks, *G. speciosus* grows quickly on a varied diet of live and meat-based foods. It, therefore, requires plenty of room and is likely to outgrow anything but the largest aquarium in a relatively short time.

Some species of Jack are important food fish in various parts of the world. Of these, perhaps the best-known in UK (although not necessarily eaten in any quantity) are the Horse Mackerels or Shads, *Trachurus trachurus* and *T. mediterraneus*, the Amberjack or Yellowtail, *Seriola dumerilii* and the Pompano, *Trachinotus glaucus*.

One species of Jack not normally identified as such by many is the well-known Pilot Fish, *Naucrates ductor* which is found, particularly in the juvenile phase, associated with jellyfish, floating debris, sharks, manta rays and turtles.



Trachurus sp., the horse mackerel is eaten worldwide

Invertebrates

AN invertebrate is an animal that does not possess a backbone. Backbone animals are known as vertebrates.

Within the aquarium hobby, invertebrates tend to figure more prominently among marine enthusiasts than among freshwater ones.

This is partly understandable because the variety of marine invertebrates available is more extensive and their colours are usually more spectacular. They are, therefore, generally considered as desirable acquisitions requiring a great deal of thought and meriting specially laid-out "invertebrate" aquaria. On the other hand, even the term invertebrate itself is hardly ever used in connection with freshwater aquaria where the majority of these organisms are regarded as pests.

This is particularly so of snails, such as the various Ramshorn species (*Planorbis* spp) and the more elongated *Limnaea* species. Not even the interesting reproductive characteristics of the Burrowing Malayan Liverbearing



Procamburus clarkii female in berry Snail, *Melanoides tuberculata* or the large, "infusoria-stimulating" Apple or Mystery Snails, *Ampullaria* sp, are considered sufficiently worthy of attention by most aquarists.

Other interesting, but largely ignored, freshwater invertebrates are the various crabs and "lobsters" (crayfish) which become available from time to time. Tropical crayfish, such as the Louisiana Red Swamp Crayfish (sometimes sold as Red Lobsters), *Procamburus clarkii*, are colourful and easy to maintain and can be successfully bred in small

aquaria. This crustacean is just as colourful and worthy of attention as its marine counterparts.

The list of marine invertebrates currently available is very extensive and the signs are that it will continue to grow, particularly as the importation of living rock and the culturing of marine algae both expand. Among the regular imports are Sponges, Coelenterates (Anemones, Corals and Sea Fans), Echinoderms (Starfishes, Brittle Stars, Sea Cucumbers, Sea Urchins and Feather Stars), Molluscs (Clams, Oysters, Mussels, Whelks, Nudibranchs, Winkles, Snails and Octopus), Worms (Bristleworms, Tube/Fan Worms and Ragworms), and Crustaceans (Shrimps, Prawns, Crabs, Lobsters and Crawfish).

Invertebrates, just like other organisms, vary in their requirements and compatibility. Some are filter feeders, some feed on other invertebrates, and many are regarded as food items by fish. Few are cheap. Thorough preparation is, therefore, required on the part of the aquarist beforehand if disasters are to be avoided.

Jawfishes

THERE are only 30 species or so of Jawfishes in (currently) three genera, *Lonchistium*, *Lonchopisthus* and *Opisthognathus*. Of these, *Opisthognathus* is the one most frequently found in aquaria. *O. aurifrons*, the Yellowhead Jawfish, is sometimes available, but never in the numbers that its interesting behaviour would suggest.

This beautiful, light-blue-bodied fish, constructs a burrow into which it can retreat when threatened or where it spends a great deal of its resting hours each day, leaving just its gold-coloured head (hence the *aurifrons*) exposed. This means, therefore, that its "total" beauty is only occasionally visible. However, *O. aurifrons* more than makes up for this in the unusual and interesting way in which it retreats into its burrow tail-first and its sometimes almost obsessive pre-occupation with the arrangement of small rocks and grains of gravel surrounding the entrance to the burrow.

O. aurifrons grows up to a length of 5 in. (c. 12 cm.) and can, therefore, be housed in an average-sized aquarium. However, its burrowing habits must be taken into account and a sufficiently thick layer of bottom material (which



An adult pair of Yellowhead Jawfish, *Opisthognathus aurifrons*, in typical courtship posture. No successful spawnings have yet been recorded in aquaria

should not incorporate sharp fragments) provided. If this is done, this Jawfish can be kept relatively easily on the usual range of marine foods

which should contain an occasional helping of livefood.

A further interesting aspect of the biology of *O. aurifrons*, which it shares with many other Jawfishes, is oral incubation of the eggs by the males. The data on the reproductive cycle of these fish are, however, incomplete as yet with the result that no fry have ever been raised successfully in aquaria.

In fact, there is little easily-available information on many aspects of Jawfish biology, thus making it possible for significant contributions to be made by aquarists willing to take up the challenge.

For the record, Jawfishes, or Smilers, belong to the Family Opisthognathidae found in the Central and Western Atlantic Ocean, the Indian Ocean and the Gulf of California. All have large mouths (they are not called Jawfish for nothing) but are not particularly aggressive towards similarly-sized fish. Unusually, the lateral line is situated very high on the body, just below the dorsal fin, and ends just behind the spinous portion of the fin.

THE rosy-lipped bat-fish lay on the bottom of its tank, as it lies on the ocean floor, because of its lack of a buoyant swim-bladder. Most fish are equipped with a swim-bladder to save them the effort of continuous swimming. Squid and cuttlefish developed quite different principles like the bathyscope and the submarine. But like the bat-fish, bottom-dwelling flatfish, skates, rays and sharks have no swim-bladders. In death they sink to the bottom, whereas fish with swim-bladders float to the surface. They make them weightless. Mackerel don't have them and swim endlessly around their aquarium tanks.

Glands from the blood fill the bladder with oxygen, nitrogen and a little carbon dioxide, and the amount and specific gravity are regulated by movements to control buoyancy at varying depths—less in deep water when its density increases to resist outside pressure. Some argentinines (deep water Salmonids) have silvery guanidine in the outer layers of the swim-bladder, used in classifying them. It probably serves to keep the gases in.

African and South American lungfish are often transported across the world encased in dry mud for stocking aquaria. They survive with their



Veiltail suffering from swim-bladder trouble



by Eric Hardy

swim-bladders developed as lungs. Courting cod grunt to their mates with special swim-bladder muscles. Talking haddock recognise each other with quick grunts and slow "knocks". Young pollack, foekbeards and coalfish make short grunts.

Turbot have swim-bladders only when young. Swim-bladders containing air are the main source of echo in fish-finders or echolocaters. Fish-flesh without this is a poor reflector. Isinglass and gelatin are made from Brazilian catfish and Russian sturgeon swim-bladders. Others go into Indian ink.

Fish-keepers are more concerned when deep-bodied fantails, veiltails, shubunkins, moors and orandas among their goldfish suffer disorders of the swim-bladder. It usually affects the joint between the bladder's larger and smaller divisions which can't expand and contract as normal and so upsets instead of maintains its balance. So the fish turns upside down and lies at the bottom of the tank. Trouble may come from pressure of extra eggs in a female fish, but it usually recovers

when the eggs are laid. Colder water may affect it. Dried food like oatmeal is suspected of causing trouble when fed continuously. A change to live foods like *Daphnia* or small worms in slightly warmer waters may cure the digestive trouble. Extra aeration is another help where overfeeding may have been to blame. Injury caused cyst-like tumours and inflation in enlarged swim-bladders of eels, containing white tissue and fluid instead of gas.

One argument for the freshwater evolution of salmon and trout is that swim-bladders, which they share, are most highly developed in primitive and freshwater fish but become small or even absorbed in many marine species. The ancient, heavily scaled African bichir gulps air into a pouch thickly lined with blood vessels at the top of its gut, which absorbs oxygen and acts as a lung. In this way bony fish probably evolved their swim-bladders, a bag of air to float in water without perpetual tail-movements.

Evolving bony connections to the inner ear-capsules, and muscles to vibrate the bladder, like catfish, white grunts and margate fish, they could pick up vibrations better, as sound, and produce drumming or rasping noises for feeding or location in dark or dirty water, using the bladder as a resonator, changing quality and quantity of emitted sounds.

A tube or pneumatic duct connects the bladder to the stomach in eels, pike, herrings, some salmon, mormyrids and bony-tongued osteoglossoids, expelling bubbles of air from mouth or gill-chambers with a squeaky noise as they rise. This is sometimes blocked with mucus and cannot absorb air gulped in. Eels don't have the Weberian apparatus connecting the bladder to the inner ear so direct transmission of sounds cannot occur so hearing is less acute than in some fish.

After trout fry (and other fish) absorb their yolk-sac they start swimming up to the surface to fill their air-bladders.

FIRST INTERNATIONAL FISH HEALTH CONFERENCE ORGANISED BY TETRA



Dr. Schubert sharing a joke and a smile with the British Delegates (right to left): Dave and Martha Sands, John Dawes, Nick Fletcher and Chris Andrews

Fish have been around for a long time; close on 500 million years. Fish pathogens (disease-causing organisms) have almost certainly been around for just as long, playing a part in controlling and, at times, devastating entire populations. Yet, despite this co-evolutionary relationship, and despite effective methods of diagnosis and treatment, we still find ourselves, as aquarists, struggling to understand and control the spread of a wide range of diseases.

Tetra's First International Fish Health Conference, held at Bad Lauterberg in the Harz mountains of West Germany, marked the first major step in the Company's long-term plan of improving fish health through an understanding of diseases, pathogens, treatments and the relationships between fish and their environment.

A large audience consisting of specialist dealers from West Germany and other European countries, representatives of the international trade and hobby press and a group of renowned aquarists were, therefore, invited to spend a weekend of lectures, demonstrations and discussions under the guidance of three eminent authorities,

Prof. Dr. Ekkehard Scupin (Göttingen University, Veterinary Institute), Dr. Gottfried Schubert (Stuttgart University, Hohenheim Institute for General and Systematic Zoology) and Prof. Dr. Heinz-Hermann Reichenbach-Klinke (Munich University, Veterinary Faculty—retired).

Fortunately for the British contingent, consisting, among others, of Dr. Chris Andrews (Tetra), Dave and Martha Sands (Dee-Bee Aquarium World Ltd.), and John Dawes (Consultant Editor—*Aquarist & Pondkeeper*), the organisers left no stone unturned, providing simultaneous translations via infra-red-receiver headphones, thus ensuring that we could follow the proceedings.

The lectures themselves provided a wealth of information, some very new, which showed many pathogens, not just as potential killers, but as fascinating creatures in their own right.

For example, Dr. Schubert's film of *Cortia*, *Oodinium* (now, supposedly, re-named *Piscinoodinium*—how about that for "new" information?), *Chilodonella*, *Ichthyophthirius* and other living parasites was, in a strange way, quite beautiful.

The remarkable ability of some parasites to infect fish was well illustrated by a number of Case Histories. One of these concerned an intestinal worm which has recently been discovered to infect *Discus*. In a large shipment of these fish from Bangkok, two out of every three *Discus* were heavily infected.

Another intestinal worm, the red *Camallanus*, originated in Singapore, is capable of affecting all species of fish and is now found throughout the world.

There are, in fact, more than 4,000 species of "worms" (12,000 is probably a more accurate estimate). Fortunately, most worms and flukes are very specific in their requirements and will only attack one or a few species of fish.

Some are egg-layers—some others are live-bearers—all are interesting. Take the live-bearing Gill worms, for instance. Even developing embryos can have embryos developing inside them! Amazing though it may seem, up to four generations may be present at any one time.

Among the egg-layers, *Triacanthulus*, which tends to affect Anabantoid fishes, e.g. Gouramis, produce eggs that will only hatch and become susceptible to treatment if they are exposed to a period of light exceeding 10 hours in length. If this does not occur, they can, apparently, develop in the eggs but remain unhatched for up to six or seven months.

Just in case any members of the audience felt that the war against parasites was a lost cause, things were, quite rightly, put into perspective by the strong emphasis placed on correct husbandry as a most effective preventative measure.

The organisers can, therefore, be complimented in their attempts at providing an informative, balanced and highly enjoyable conference in magnificent surroundings, perfectly matched by an excellent programme of social activities. This included a visit to Tetra's impressive West Aquarium which we will, hopefully, be able to feature in a future article on Tetra.



Helping Hand



by Nick Lushchan

I WOULD like to take this opportunity to introduce myself to you. My name is Nick Lushchan. In July 1979 I had an accident that damaged my spinal cord, leaving me disabled and with a very painful back.

In 1982 my family bought me a tank plus fish (Guppies and Platies) and that's when my problems really started!

After a lot of planning and experiments, I managed to overcome them with the aid of my wife, Ann and daughter, Michelle. Now I can cope with most of the work myself.

Although we soon had 12 tanks with a variety of fish, we still wanted more of a challenge, so in July 1983 we started showing fish. To our delight we entered five open shows and won five firsts, plus a number of runners up prizes. This must prove that others in a similar position can achieve results. By going to Fish Shows you meet people with the same interests as yourself, and learn more about the hobby from experienced aquarists.

The reason for this introduction is to ask that, if you know of anyone who is keen on fishkeeping but feels held back due to a disability, I would be more than pleased to hear from them.

I would like to establish contact between disabled aquarists through a regular exchange of experiences, advice, tips and anecdotes. In this way we may be able to present a view of the hobby to able-bodied aquarists that they may well be totally unaware of, as well as learning from each other on how best to overcome the problems we encounter.

As my disability left me with restrictions of mobility, lifting and

bending, I encountered problems with numerous aspects of fishkeeping, including: water changes, carrying water (old and new), fitting heater/stats (with straps), fitting lights onto hood of tank, making electrical connections, servicing a pond, and, the most important, visiting shops.

I would like to hear from you with your opinions on the subject, plus the ways in which you have overcome your own problems.

If you have any unusual methods or equipment that might be beneficial to disabled fishkeepers then put pen to paper straightaway—don't let the opportunity slip by. For those wishing to respond to this article, please send your replies with S.A.E. to:

**NICK LUSHCHAN,
27 HUNGERFORD ROAD,
RUGBY HOUSE,
CALNE,
WILTS. SN11 9BH.**

Phone: 0249-812828.

Personally speaking, I would like to

pass on to others the pleasures of fishkeeping, hoping that they can find the same satisfaction from this great hobby as I do.

So, come on, all you disabled warriors, **THIS IS YOUR CHANCE** to speak out with your problems (and experience), at the same time **HELPING** fellow warriors to make **LIFE** more tolerable in this great hobby, with the emphasis on **HELP**. So write to me . . . with **YOUR** co-operation there is a lot we can do to improve the state of the hobby for all disabled aquarists.

A word for manufacturers

If you manufacture aquarium equipment that you feel is particularly suitable and easy for disabled aquarist to use, I would be very pleased to hear from you. For our part, we may be able to make constructive suggestions concerning the design of equipment or, at least, make you aware of problems that you could never otherwise realise.

Part of my present set-up. Most of these tanks will soon be transferred to a specially designed fish house





by
Roy Pinks

It happens to all of us from time to time: that well established and apparently prosperous tank for some reason goes wrong and we have to decide what to do about it. Sometimes, if it has been set up for not too long, we can put things right, perhaps by some judicious new plantings or by introducing some additional fish after quarantine, but in practice changes are seldom for the good, and if we are not really satisfied with what we have, it is best to start all over again. I cannot think how many thousands of words I have written about the need to think hard before setting up a new tank, but a recent experience of mine illustrates very clearly how easy it is to go badly wrong even after all the pros and the cons have been weighed most carefully.

I got the first stage absolutely right. The tank was set up to a plan I had thought about at length, and after I had spent a small fortune on plants I certainly took my time over locating them to best advantage and in allowing them to begin to grow away—the

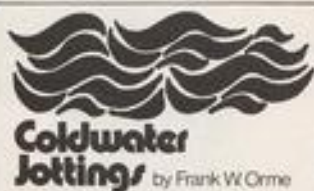
first sign that one can begin to consider the introduction of fish. As the tank was in full view of visitors I decided that I would restrict species to a mere handful, but to have one large shoal of Cardinals together with a supporting cast of *Pristellas*, Bleeding Hearts, Platinum tetras and a quartet of Congo tetras. A quarantine tank was set up and was occupied for over a month, and as there was no sign of disease, the fish were finally and successfully introduced, and the overall effect was extremely pleasing.

Oddly, the shoal idea came quite unstuck. Only the Platinum tetras maintained anything like a formation: these were magnificent fish, wild-caught (more about them in another article), and even though there were only half a dozen of them, the result was staggering. The remainder of the fish (and there were some 25 Cardinals) mostly straggled round and about, though small groups would sometimes join together but rarely remain so for very long. This was rather a disappointment, as shoals have a particular attraction to the onlooker and we are all familiar with their appearances in the big shows, where single species show tanks really draw the crowds. I think the reason why fish at shows in such conditions actually group together quite so well is that the shoal is the unit of security: the fish concerned have been newly introduced to unfamiliar surroundings amidst great turbulence, and they tend to stick together. Perhaps in our homes they sense less disturbance and can relax!

For several weeks my tank continued to prosper, but I was increasingly concerned and irritated by the disappearance of newly sprouted plant growth. In many cases great chunks had been torn from soft growing leaves, and the dwarf *sagittaria* looked to have been trimmed by a mini lawn mower. Eventually, as I have noted elsewhere, the culprits turned out to be the Congo tetras, and though I turned a blind eye for a few days it began to be a pressing matter to

stop the pilferage if the plants were to survive. Now, how is one supposed to capture four very fit fish like these from a properly planted tank? There's nothing in the books about it, but as I had done the recommended thing by keeping the front gravel low and the rear gravel high, I concluded that if I drained the tank the fish would all swim to the front, whence I could net the miscreants. I spent the next hour carefully siphoning the water into a newly cleaned plastic dustbin, congratulating myself that apart from this not very serious disturbance, the problem would be solved quite soon. The next thing that happened, when the water was getting pretty low, was a nasty sizzling noise and a smell of scorched foliage, which alerted me to the fact that I had forgotten to disconnect the heaters! By then it was just too late, as a splash of water on a marooned heater caused it to crack (it was an old glass one), and there I was without a spare at 5 p.m. on a Saturday.

The next hour was something of a nightmare. Two of the Congos were caught from the water at the front of the tank, but the others might have been anywhere. As it was essential to isolate them I had no alternative but to dismantle the entire tank and transfer the fish to my permanent quarantine tank situated "downstairs" in the same cabinet. The precious plants were rapidly housed in a spare tank and I made a beeline for the local dealer to beat the closing deadline, as I wanted to lose no time in getting the plants re-established, for nothing kills them off as quickly as being packed together in a tank for a few days without all-round light. The silver lining in all this was that the layout of the newly arranged tank, though similar in many ways to the earlier one, was just that bit better, making this ghastly episode bearable. It was no consolation that I really had put in a lot of thought and that I had a cupboard full of spares—of everything but an individual 100W heater.



THE man had a most woeful expression upon his face, as he stood, bucket in hand. "Do you remember me?" he asked. "I bought some fish from you last year, and wondered whether you had any more available." Well, yes I did remember him and recalled that he had purchased a number of Bristol shubunkins to place in his new pond. He was invited to see this season's young fish and, upon being assured that I could let him have a few, began to smile a little more happily.

After the fish had been studied, and the chosen ones selected and placed into his bucket, I enquired how the other shubunkins were progressing. I should not have asked, for his apparent pleasure was immediately replaced with a look of mixed embarrassment and woe. From his expression it was quite obvious that all was not well, in fact I felt certain that I could anticipate his reply. "I, er—I'm sorry, but I lost them," he said. It was the old story; initially the shubunkins had the new butyl-lined pond to themselves, where they ate well and grew well without any problems. Alas, the fair came to town, and a visit to its pleasures resulted in the winning of two goldfish. My visitor explained that the fairground fish appeared to have nothing wrong with them so, at the insistence of his young daughter, he allowed them to join the shubunkins in the pond. For a short time all was well; however, it was not too long before losses began to occur and, within a few days, there was not a fish left alive!

This tale of misfortune gained no sympathy from me nor, I was told, had any been expected. I knew this man was a keen tropical fish enthusiast who admitted that under no circum-

stances would he have placed a non-quarantined fish with his healthy stock—yet he failed to observe the same elementary precaution with the coldwater fishes.

The moral is that all new fish, no matter where they may have come from, should never be allowed to join any existing healthy stock until after they have been subjected to a period of quarantine. For all general purposes 28 days should be sufficient to allow any unsuspected, dormant or latent, problem to reveal itself and allow the aquarist to take appropriate action. It is far easier to keep any new fish in a separate aquarium where it can be kept under observation, than to release it and then discover that it has passed an infection of disease or parasites to any other fish occupying the same water. This simple basic precaution is pure commonsense, and an elementary part of fish keeping. Observe it and the possibility of introducing an unwanted problem to the pleasure of keeping fish is thereby greatly reduced. Ignore it, then blame

no-one but yourself if things start to go wrong!

I have lately noted a sudden increase in the number of common frogs, they range from the quite small to large adults. In fact there are so many that, during this month, the larger proportion will have to be removed to natural ponds a few miles away. This increase in the frog population is most welcome but cannot be allowed to remain in my average size pond—it has become much too crowded. In addition to the frogs, the water also contains a large number of tadpoles which will soon become miniature frogs. At a later date many of these will have to be found a new home in some natural waters. As many people have found, the frog is becoming very common in garden ponds which it has found to be a suitable alternative to its more natural, but fast disappearing, ponds of the countryside.

Tadpoles still clinging to jelly from which they have hatched



Meet the Societies



DARWEN AQUARIST SOCIETY



The D.A.S. logo



Angel tending eggs

DARWEN A.S. has only been going for seven years and yet it has already developed a strong reputation within Showing circles for the excellence of the Tableaux entered at major Aquarist Festivals.

However, before going into this in a little more detail, a brief summary of the history of D.A.S. and its activities would not come amiss.

All the Society's current success can be traced back to a meeting at Fins 'n' Things (owned by Mr. G. Douglas) in Darwen. There were 12 aquarists at this meeting and they decided that it was about time that the town had an Aquarist Society. An official meeting followed on Monday 18th April 1977 and D.A.S. was born.

Within a year the first Open Show was mounted at Derwent Hall in Darwen. This was a considerable success and set a standard which every successive Open Show has attempted to improve on.

In 1979 D.A.S. amalgamated with Blackburn Aquarist and Waterlife Society. This expanded the experience and outlook of Darwen members and led to the now-regular participation in the major Festivals where D.A.S. has its own stand. 1982 saw the first attempt at producing a Tableau for the British Aquarist Festival. The effort was well worth it, picking up a meritorious third prize. This was followed by the highest prize of all at the 1983 Yorkshire Aquarist Festival, the first time this had been achieved by an F.N.A.S. Society.

Since then, things have continued to flourish and 1984 is bringing its own fair share of success. Yet, despite this, D.A.S. continues to have its feet firmly planted in the ground. It still runs informal sessions for beginners and juniors about once a month. These are held at the Chairman's house with, at least, one experienced aquarist in attendance to help out with questions and problems. The same informal, but constructive, approach extends to the "normal" meetings at the Albion Hotel, Railway Road, Darwen.

For further details of all D.A.S. activities, including the Open Show, scheduled for Sunday 30th September, contact Derek Gow (see below).

Subscription Rates: Adults, £4.00; Family, £6.00; Juniors, £1.00.

Apply to: Derek Gow, 27 Nancy Street, Darwen, Lancashire.

Longbenton Aquatic Society



The L.A.S. logo



Angel guarding eggs

If YOU look at the logo which appears in the column on D.A.S. (alongside), you will see that both our Societies this month have chosen the majestic Angel as "their" fish. Two other features that they share are their "northern" base and their "youth".

L.A.S. is, in fact, only in its second year. It was formed in April 1983 by a group of fishkeepers from the Longbenton area of Newcastle-upon-Tyne with the main purpose of providing opportunities for aquarists of all ages and experience to advance their knowledge of, and promote interest in, all aspects of the hobby.

L.A.S. believes that sheer enjoyment should form a large part of fishkeeping and, therefore, organises its activities as social events. Certainly, there are formal lectures, slide shows and discussions, but there is a great deal more besides. For example, visits to members' homes are encouraged so that all can share and experience a variety of approaches to solving aquatic problems, including the successful growing of aquarium plants.

After trying out a few venues, the committee obtained the use of a Biology laboratory at Longbenton High School in Hailsham Avenue, Longbenton, through the kind generosity of the Headmaster. This excellent venue offers rather unique opportunities, such as the use of chemicals, electric pH meters, water hardness kits, and the study of culture techniques for livefoods, including wingless *Drosophila*, Glassworms, Infusoria and others.

The link with the school is further reinforced in that L.A.S. members have taken over the maintenance of two 4 ft. tanks which stand in the school foyer and act as a pleasant focal point for pupils, staff and visitors. Already some pupils have joined the Society's ranks.

Despite its youth, L.A.S. is engaged in yet other activities. For instance, there has already been an auction and a Newsletter, discount arrangements have been made with some local shops, and plans are advanced for the first Open Show.

Meetings take place fortnightly (on Tuesdays) at 7.00 p.m.

Subscription Rates: £2.00, plus 30p per meeting.

Apply to: Mr. N. W. Liddell (Secretary), 282 West Farm Avenue, Longbenton Estate, Newcastle-upon-Tyne NE12 8US.

NEWS...

Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

SEPTEMBER

2nd September: PRESTON & DISTRICT A.S. annual open show. Venue: Preston North End Supporters Club, Deepdale Road, Preston. Further details and schedules from Mr. W. Rawlinson, 364 St. George's Road, Preston. Phone: Preston 25270.

6th September: 26th HENDON ANNUAL CONVENTION. Lecturer: W. A. Toney of Holland. Details from T. Glass. Tel: 01-727 7481.

8th September: BRISTOL TROPICAL FISH CLUB open show will be held at the St. Saviour's Church Hall, Grove Road, Fishponds, near Bristol, benching 9 a.m.-12 (noon). Schedules will be available from mid-June from Show Secretary, Mr. T. E. Davis, 264 Radwin Road, Colgate Heath, near Bristol, BS17 2QW, or telephone: Winterbourne 775432. S.A.E. with application please. Show will be to F.B.A.S. rules and incorporate Aquarist Gold Pin, Championship Trophy Class and Brooch Scheme.

8th-9th September: Fourth annual Fish Keeping Exhibition to be held at the Memorial Hall, Littlebourne, Gasterbury.

9th September: NORTHUMBRIA COLD-WATER FISH AND PONDKEEPERS SOCIETY will be holding their annual open show, but the venue has not yet been agreed upon. As soon as this is finalized you will be informed.

9th September: TONGHAM A.S. open show at Bull Civilian Restaurant, Buller Terrace, off Alisons Road, Aldenham, Hants. Benching 9-11.30 a.m. For further details contact Steve Bates on Yateley 876439.

9th September: CHELTENHAM TROPICAL FISH CLUB open show at St. Mark's Community Centre, Brooklyn Road, Cheltenham. Schedules from M. Jenkins, 3 Marlborough Place, Princes Street, Cheltenham. Tel: 0242 523199.

9th September: SALISBURY & D.A.S. annual open show at the Activity Centre, Wilton Road, Salisbury. Judging to F.B.A.S. standards. Further information and show schedules available from Mr. D. Edleston, 33 Somerset Road, Salisbury, Wilt. Tel: 0722 26219.

9th September: HUDDERSFIELD TROPICAL FISH SOCIETY open show at Slazebate Civic Hall, Slazebate, Huddersfield. This year Aquarian Foods are sponsoring the society.

10th September: BRISTOL A.S. Cold-water Fish show at St. Ambrose Church Hall, Streetford Road, Whitehall, Bristol, from 3-5.30 p.m. Details and schedules from Show Secretary, V. Capaldi, 7A Walsingham Road, Bristol BS4 5BT. Tel: 0272-426523.

10th September: HOUNSLOW & DISTRICT A.S. open show at the Hounslow Youth Centre, Kingsley Road, Hounslow and details from Mr. T. Bellinghrope, 2 Holmwood Close, Addlestone, Surrey. Tel: Weybridge 54976.

From Aquarists' Societies

10th September: NORTH STAFFS & DISTRICT A.S. open show at Thimbley Hough High School, Penkall, Stoke-on-Trent. Schedules and further information from Mrs. E. Hackney, 146 Congleton Road, North, Scholar Green, Stoke-on-Trent.

10th September: DORCHESTER TROPICAL FISH SOCIETY. Change of Show date, 4th open show will still be held at the Boys' Brigade Hall, Swinmill Lane, Weymouth Avenue, Dorchester, Dorset. Schedules available from Mr. B. Symes, 3 Ashburn Green, Poundbury, Dorchester, Dorset DT1 2PS, or phone: Dorchester 47557.

10th September: ST. EDMUNDSBURY & DISTRICT A.S. second open show at Northgate Community Centre, Bury St. Edmunds. Schedules available from Mr. S. Forsey, 70 Northumberland Avenue, Bury St. Edmunds (s.a.e. please). Fish auction, canteen facilities, annual trophies, other attractions are planned.

10th September: CHESTERFIELD AND DISTRICT A.S. open show at Westfield Upper School, Mosborough, Nr. Sheffield S41 9BN. For further details contact A. Joyce (Show Secretary), 27 Dancy Road, Eckington, Nr. Sheffield S31 9BN; telephone: Eckington 433 888.

10th September: TONBRIDGE AND DISTRICT A.S. are holding their open show at Tonbridge Wells Technical High School, Tonbridge Wells.

10th September: ELLESMERE PORT A.S. second open show will be held at the T.A. Centre, Stanney Lane, Ellesmere Port, Cheshire. Benching times are from 12 noon to 2.0 p.m. Plaques for all class winners, annual trophies, etc. Further information, schedules, etc., from Len Bowman, 50 Maple Avenue, Little Sutton, South Wirral L66 5QT; telephone: 051-339 6024.

22nd September: BASEINGSTOKE AND DISTRICT A.S. Show cancelled.

22nd September: WOLVERHAMPTON A.S. open show at Fensfield High School, Marsh Lane, Fensfield, Wolverhampton. Show Secretary, Barry Jones, 23 Higgworth Close, Perion, Wolverhampton. Tel: Wolverhampton 750144.

22nd September: WYKE SHOW SOCIETY, are holding their open show at the College of Further Education, Ingleside Lane, Hull.

22nd September: WALTHAMSTOW & DISTRICT A.S. open show at Queen Mary College, 98-110 High Road, South Woodford, E.18. Details from: Mrs. M. Waller, 32 Hamilton Road, Heath Park, Romford RM2 5SD.

26th September: DARWEN A.S. are holding their annual open show at the Library Theatre in Darwen.

30th September: SUNDERLAND A.S. are holding their second open show in the Pennywell Community Centre, Sunderland.

30th September: EDINBURGH AQUARIUM & PONDKEEPERS are holding their 12th annual open show in the Craigroyton Community Centre, Edinburch.

OCTOBER

7th October: HALIFAX A.S. open show at Forest Cottage Community Centre, Green Lane, Ilkley, Halifax. Schedules on request. S.a.e. please to David Shirls, "Lobbsstones", Gainsay, King Cross, Halifax HX2 7DT, or ring for details Halifax 60118.

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

7th Oct: The **DEREHAM A.C.** are holding their second annual Fish Show at the Memorial Hall, Dereham Norfolk.

7th October: DALKEITH COMMUNITY CENTRE A.S. will hold its open show at the Centre. The Show Manager is: John O'Sullivan, 25 Park Avenue, Loanhead, Midlothian EH20 9BE.

7th October: NEWBURY & DISTRICT A.S. 12th open show at the Coes Exchange, Newbury. Schedules from Mrs. Iris Gale, 5 First Avenue, Ravening Park, Aldermaston, Berks. Telephone: Tadley 3130.

14th October: PRESTON & DISTRICT A.S. autumn auction to be held at Preston North End Supporters Club, Deepdale Road, Preston. Further details from the Secretary, Mrs. J. Cornwell, Chorley 69312.

20th October: ILFORD & DISTRICT AQUARIST & PONDKEEPERS SOCIETY Golden Jubilee 1994 Annual Exhibition of Fish at the Ilford Town Hall, Ilford, Essex. Doors open 11 a.m. (approx.)

21st October: BRITISH CICHLID ASSOCIATION Convention '84 at the Lanchester Polytechnic, Coventry. A.G.M. 11 a.m. Cichlid only auction followed by illustrated lecture by Tony Ribicki re "Lake Malawi and its fishes". Tickets available from D. Monk, 33 Kirkmeadow, Breton, Peterborough. Price £7 for non-members. £5 for members. (Auction items restricted per member and must be pre-booked.)

21st October: SOUTH LEEDS A.S. are holding their open show at Collingham Memorial Hall (near Leeds). More details from Mr. M. Tomkinson, Leeds 775551.

28th October: CENTRAL MIDLANDS CICHLID GROUP auction of fish and aquatic accessories at the Peace Memorial Hall, Fookridge, Staffs. Auction commences at 1 p.m. Further details from Marlene Hall, 71 Saxton Road, Fookridge, Staffs. Tel: (078 571) 3944.

NOVEMBER

3rd & 4th November: BRITISH AQUARISTS' Festival. Belle Vue, Manchester. Details and schedules from J. V. Hall, 94a Carr Road, Calverley, Pudsey, Yorks. LS28 5RL.

4th November: ESSEX & EAST OF LONDON A.S. 5th Convention at St. Augustine's Church Hall, Birkbeck Road, Rush Green, Romford, Essex, commencing at 2 p.m. There will be two speakers, Jim Chambers on "Live Bearing Fishes" and a speaker from the Kiv Society. Part of the afternoon will be taken up by a Krypton Factor Type of Quiz which is being organized by Ilford A.S. Tickets (£1 can be obtained from Dave Herman, 1 Windmill Meadows, Aythorpe Road, Dagenham, Essex. S.a.e. please.

11th November: BRADFORD & DISTRICT A.S. are holding their open show at Clayton Village Hall, Revsayke Road, Clayton, Bradford. Further details can be obtained from the Show Secretary, Mr. K. Lister, 1 Libert Avenue, Bierley, Bradford. Tel: 0274 683735.

17th November: CATFISH ASSOCIATION OF GREAT BRITAIN Convention will be held this year at Ayrwood Lower School, Windmill Road, Edmonston, London N18. Our main speaker will be Mr. Heiko Böher of Germany, fish collector, importer and photographer.