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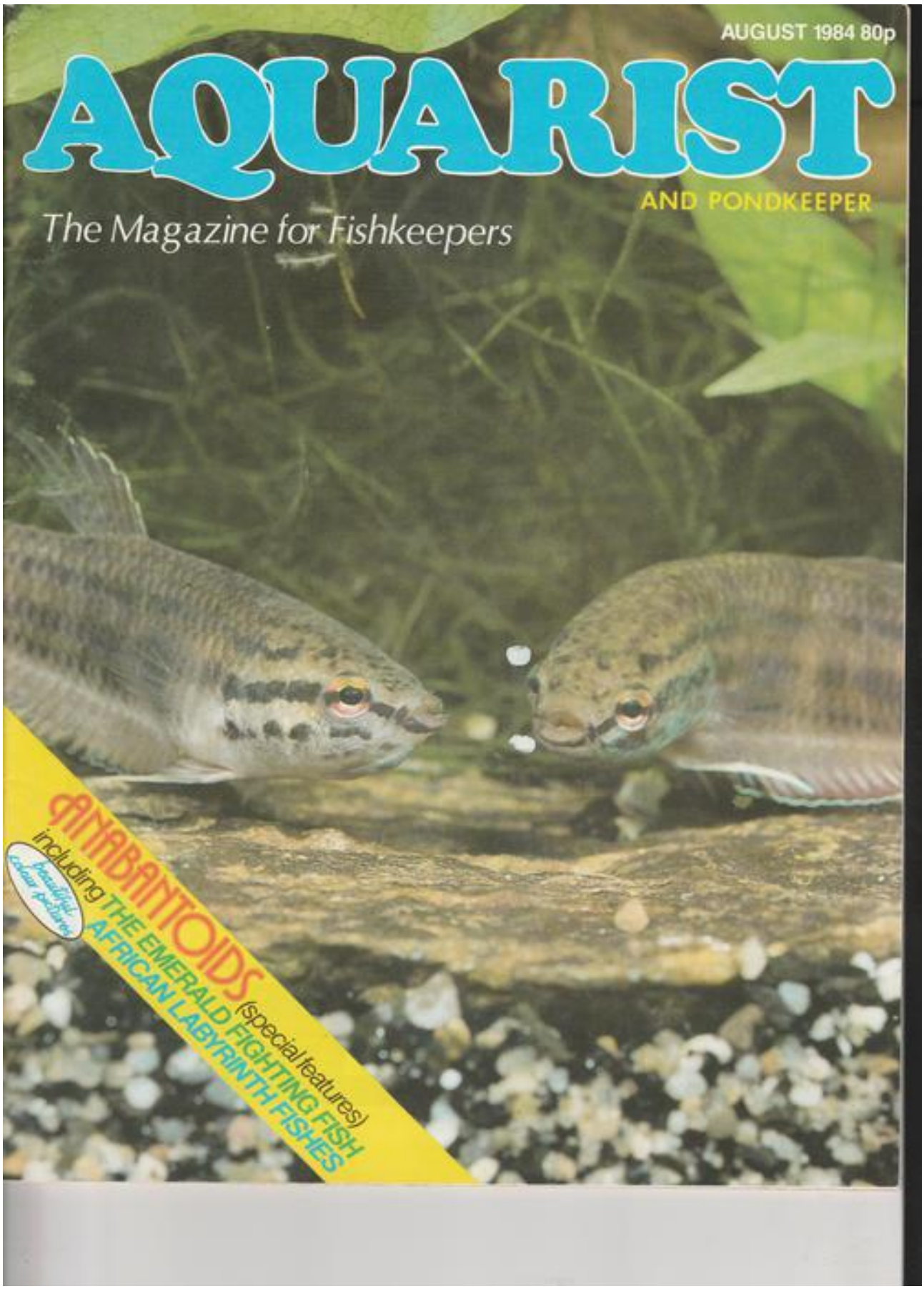
AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



ANABANTOIDS (special features)

including THE EMERALD FIGHTING FISH

AFRICAN LABYRINTH FISHES

Beautiful colour pictures

COVER STORY *Photo: A. van den Nieuwenhuizen*

Betta picta is one of the more rarely-seen "Fighters" in the hobby. Recent importations by the Anabantoid Association of Great Britain should make this delightful mouthbrooder more widely available but, bearing in mind the relatively small number of offspring produced (around 100), this process is likely to take time. A second feature is the retiring nature of these fish which do best in heavily planted aquaria. Unfortunately, this can make direct observation difficult at times, rendering *B. picta* more suitable for species, rather than community, tanks.

Being a *Betta* (although this is in dispute—see *A-Z of the Aquarium*, May 1984), *B. picta* belongs to the Family Belontiidae. Other member species include all the other Bettas, such as *B. splendens* (the Siamese Fighting Fish), the Gourami genera *Colisa*, *Trichogaster* and *Sphaerichthys* and the Combtails, *Belontia* spp., after which the Family was named.

B. picta shares the mouthbrooding characteristic with the following *Betta* species. It must be stressed that some of these names may not be valid, i.e. they may be synonymous:—*anabantoides*, *brederi* (may be a variety of *pugnax*) *macrostoma* (the Brunei Beauty), *ocellata* (probably synonymous with *unimaculata*), *patoti* (does it exist?), *pugnax*, *rubra* (probably *picta*), *taeniata* (probably *picta*), *trifasciata* (probably *picta* or *taeniata*) and *unimaculata*.

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AQUARIST

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Your questions answered...

TROPICAL

Dr. C. Andrews

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

unusual catfish . . .

I have seen a catfish in a local pet shop that I believe is a species of *Panaque*. The basic colouration is dark grey to black with a silvery sheen. The striking feature is the deep blue eyes the fish has. Can you identify this fish for me?

Panaque

I've checked your description with Dave Sands and he assures me that this catfish is, in fact, *Panaque nattoni* from Colombia. This fish can be maintained quite easily in the aquarium, where it will feed on good quality flaked food. It is rather hard on plants—so be warned! You will not find much information on this fish in the hobbyist literature, although this species (and many other loricarid catfish) will be featured in volume four of Dave Sands' 'Catfishes of the World'.

new aquarium . . .

Having recently started up with fishkeeping again, after a lapse of about 15 years, I wonder if you could give me some general hints on setting-up my four foot tank for tropical freshwater fish?

Of course it is almost impossible for me to provide you with all the information you require in a short reply such as this, and hence I have sent you a copy of the *Complete Aquarist Guide* which was given away in installments with last year's *Aquarist* magazine.

Allowing for water displacement with rocks, etc. your 48 in. × 12 in. × 15 in. tank holds about 28 gallons (or 126 litres) of water. In your letter I noted that you are keen to use power filtration in the establishment of a community tank. Choose a reliable filter which turns over the tank volume several times in a 24 hour period.

Do not forget to maintain the filter regularly, and clean or replace the media from time to time. Power filtration, nor any other type of filtration, does not get rid of the need for regular partial water changes (perhaps 25% every 4 weeks).

Hints on lighting, plant growth and heating (you will need about 200-300 watts of heating) are provided in the 'Guide'.

piranhas—again . . .

Can you give me some information on the aquarium care of piranhas?

Judging by the number of letters I receive, piranhas must be very popular aquarium fish!

Piranhas can be kept in the home aquarium although they are not as robust and hardy as their reputation might suggest. They must be given the respect they deserve, as even quite small individuals can give a nasty bite.

They are *not* a community tank fish! Piranha are best kept as a single fish in a 15-20 gallon tank, or as a small shoal of five or six individuals in a much larger aquarium. The water temperature should be a constant 25-28°C. When small they will feed on all manner of live food and scraped lean raw beef. As they grow older they can become accustomed to a diet of lean raw beef and occasionally, fresh or frozen raw fish. Dead goldfish, guppies, etc. may add variety to the diet, but beware of introducing disease in this manner.

The aquarium is best set-up along fairly spartan lines: a good external power filter, a minimum of strong living or plastic plants, and a layer of gravel (if desired). Rock caves may be provided—but beware of nervous piranha injuring themselves on sharp edges. Piranha have been bred in the aquarium—but spacious quarters along with a good, varied diet seem important to bring the fish into spawning condition.

Piranhas tend to be rather messy feeders. All excess food should be removed once it has settled onto the tank floor. Every week about 25% of the water and all the accumulated debris should be siphoned out, and the tank topped up with fresh water at the correct temperature.

snakeheads . . .

Can you give me some general information on snakeheads?

Snakeheads (*Ophiocephalus*) are not usually very difficult to keep or even breed. They are of course predatory by nature and some may grow to over one metre in length. They seem to


Arthur Boarder


Vivian De Thabrew


Hilda Allen


Graham Cox


Eberhard Schulze

like a tank with one or two solid hiding places, a steady temperature around 25°C, and they are not really fussy over water conditions. Snakeheads may become quite tame, taking raw meat or fish from the hand.

C.A.

Coldwater

breeding orfes . . .

I have some golden Orfe in my pond which are from four to six inches long. They have never bred but my goldfish in the same pond do so regularly. Can you explain why?

Orfe need to be larger to breed than yours are at the moment. Also they need very well oxygenated water and plenty of swimming space. You did not state the size of your pond but with all the fishes you appear to have, it may be that it is over-stocked. To encourage the fishes to spawn, try running some cold tap water into the pond late in the evening, but you are too late for this season now. Orfe usually spawn in the spring. They should have plenty of live food leading up to the spawning period. Check up on the stocking rate and you should allow a square foot of surface area of water for each inch length of fish, excluding the tail.


At four inches this orfe is too small to breed

a new pond . . .

A few years ago I had a small garden pond but did not have much success with it. I have now moved and intend to make a larger one with a liner. Have you any tips you can give me so that I can start off right?

You should be able to have success with your new pond as you are starting right by making enquiries first. So many people make a pond without find ing out any of the possible snags first. Many people wait until a fish is half dead before asking for advice and by the time the letter in reply reaches them, the fish is dead.

The most important point to remember is to have patience and get a good state of water in the pond before adding any fishes. When the pond is constructed, fill it and allow it to stand for two or three days and then empty, wash round and re-fill. The water will be ready for plants after a couple of days. Use no base compost. The most important plant is the water lily. This serves three useful purposes. First by the flowers which are most attractive and brighten up any garden. Then the leaves are also attractive with their shiny surface. These can shut out much of the direct sunlight and so prevent a lot of floating green Alga from forming. Lastly their roots, when they spread outside the container, can use up much of the waste matter in the water.

Do not worry about using many oxygenating plants as they are not as important in a pond as they are in a tank where the surface area of water is very restricted. Having allowed the plants to settle, a few fishes can be added. Do not try to stock the pond to its limit of an inch of fish, excluding the tail, to each square foot of surface area of water. Three of four small fishes may be introduced to see if the water is in a good condition. Always stock with young fishes as they are more likely to thrive than would larger ones which have been a long time in different conditions. Do not add any water snails, as they do no good and can bring in pests and diseases. Do not start to feed the fishes as soon as they are in the pond; this is the most frequent mistake made by beginners. As soon as the fishes are in the water food is often thrown into the water, often to remain uneaten and to cause pollution and the fishes often go off feeding and things go from bad to worse. After two or three days the fishes can be tempted by throwing a small piece of brown bread crust on the water. If they come up to take it, then they can be fed, but still sparingly. More ponds go wrong through overfeeding than from practically all other causes. All these points and many more are included in my book "Coldwater Fishkeeping".

A.B.

Plants

crypts, ceratopteris et al . . .

Four months ago I added Cryptocorynes nevillii, wendtii and ciliata to the existing Hygro, Vallis and Ceratopteris. Crypts are doing

poorly. Tank is 48 in. × 12 in. × 15 in. lit by 30 watt Grolux on for 6 hours per day. Water is neutral, temperature is middle 70's. Any advice please?

Ceratopteris thalictroides

I think your main problem is inadequate lighting. *C. wendtii* and *C. ciliata* both require fairly strong light. For your tank you would need 2 × 30 watt tubes on for 8 to 10 hours per day. Your water temperature seems alright, but as Ceratopteris and most Cryptocorynes prefer slightly acid water conditions, it might help to incorporate some peat into your planting medium in order to make the water slightly more acid. Make sure you have a good depth of planting medium, too, (3½ in.-4 in.) to allow for good root development, and hence strong, healthy plants. **V.T.**

Koi

variations . . .

Since I started to keep Koi in a small way I have seen a great variation in the general appearance and colours of Koi for sale locally and at water garden centres. Can you tell me why this should be as I have been assured that Koi is a word in Japan and all Koi come from that country?

Yes, Koi is a Japanese word meaning carp. If giving these beautiful fish their proper name "Nishikigoi", this can be literally accepted as meaning fancy carp which you will readily appreciate covers the wide range of colours, patterns, scalings, etc. usually associated with these fish.

There is no doubt that the development of a few minor colour variations of the common carp into the present day standard of multi-coloured Koi did originate in Japan. If your reference to general appearance means quality rather than healthy, then it is equally true to say that the best quality Koi do come from Japan.

As a result of the ever-increasing appeal and popularity of Koi in the last decade or so, Koi are now more intensively farmed in several areas of Japan to satisfy the demand for relatively cheap garden pond type fish.

Prices can vary enormously from almost pence to thousands of pounds, dependent on both the quality and size of the Koi. In the U.K. the cost of air-freight can add dramatically to the price of a medium to large specimen when individually packed.

It is recognised that all so-called Koi do not come from Japan, they are imported from the U.S.A., Singapore, Israel and even European sources as far as I am aware.

Koi, for want of a better word to signify these fish, whether they are Japanese or not, do breed in this country and some quite good Koi are produced where the facilities of home-breeders allow growing-on in the more or less natural conditions of large ponds or lakes.

However, the first-class breeding fish established through many years and the necessary expertise to cull, assess and develop prize Koi of great value remain in Japan. **H.A.**

Marine

new-tank fish . . .

I would be very grateful to you if you would kindly put my mind at rest on the following points. I have asked various dealers in and around the area in which I live and they either all give a different story or in the case of one chap last Saturday morning when I went to make a purchase his reply was "you learn by experience".

1. Once the nitrite reading has dropped in a newly set-up tank using Damsels to start with, how long before the more colourful of marine fishes, e.g. Butterflies and Angels can be added?

2. How long are marine fishes safe? Also the bacteria in the sand when, due to a fault, the filters and aeration stop?

3. After the use of 'Cuprazin' in a set-up tank is a water change advisable even if a water change has recently taken place?

4. When running a spare marine tank as an emergency set-up, e.g. to be ready for a quick water change should something go wrong, is it quite sufficient to have just the saltwater running and heated to 75°F or is shell or sand or for that matter anything else needed to keep the saltwater in good condition, until it is needed?

5. When a tank clean out is due would the fishes be safe in a spare tank with some of the old seawater syphoned into it and just a large airstone running in it, or would it have to have filters and shell or sand in it also to keep everything in order whilst the main tank is being cleaned?

6. Would you please give me the names of marine fishes that in your opinion are tolerant to nitrite particularly in the early stages of setting up a marine aquaria?

A Damsel or Demoiselle

1. *Addition of marine showfish to a new tank.* Spend at least one month (and preferably 3) learning how to look after 2-3 Damoiselle fishes, i.e. 'superfish'—analogous to 'Superman' in their incredible hardiness and dazzling colours, before throwing your hard-earnt cash about on marine showfishes.

This will achieve the following objectives:

(i) The deep coral-sand filter bed will achieve **total** bacterial maturation during this apprenticeship period.

(ii) You will acquire the crucially important skills of miserly feeding and disease diagnosis/treatment/prevention.

2. *Failure of U/G filters and aeration.*

If this occurs at nightime when the tank is in total darkness there is no problem since the fishes' metabolism has fallen to an extremely low level.

If on the other hand this happens during the daytime when your lighting is switched on, you have 2-4 hours (depending on stocking densities) to fit a new diaphragm to your pump.

3. **'Cuprazin'**, etc. Due to the fact that **all 'Waterlife's'** medications are totally biodegradable, no water change is ever necessary after using **'Waterlife'** products.

4. *Reserve seawater.*—All you need is a 20 gallon plastic dustbin full of synthetic seawater with a **'Longlife'** diffuser (i.e. non-clog type) to aerate it before usage. I keep mine in a spare bedroom—much to the digust of visitors. But then, its all a question of priorities isn't it?

5. *Tank spring cleaning.* I have never yet moved either fish or invertebrates from my tank when cleaning the filter-beds. It is totally unnecessary to do so.

6. *Damselfishes.* **G.C.**

Discus

setting up . . .

I have just purchased a 63 in. × 16½ in. × 21 in. aquarium. I have a Eheim 2015 power filter with U/G through flow principle and my gravel is inert pea gravel. I wish to make it into a Discus tank and would like as much information as possible on how to set up and maintain a Discus tank. For example, is the U/G through flow system alright? If not, why not? Also, why do people paint the back of the tank instead of putting a picture? Is my gravel alright? What pH balance do you recommend? How many fully grown Discus could I have? What plants do you recommend? What is a deionising unit? If I have missed anything out please send me anything else you have on Discus which would be of use as I want my set-up exactly as it should be!

Your aquarium is certainly a nice size for keeping Discus fish and in it you will be able to keep about six or seven fully grown specimens. As far as your filtration is concerned you certainly have chosen the 'best' system available; but as for the 'inert' pea gravel, I was not aware that pea gravel is inert and I am sure you must be wrong about this. It is a simple matter to find out whether a gravel is inert by just keeping a handful in deionised water or pure water. Measure the hardness and pH value of the water before you put the gravel in and again a day or two later. You will probably find that both the hardness and the pH of the water has gone up which indicates that the gravel is not inert. If you want to make gravel 'reasonably safe' I suggest you keep it for 24 hours or so in a solution of diluted hydrochloric acid when a great deal of the hardness will be neutralised. Wash the gravel out afterwards with a great deal of water to remove any traces of the acid. Although you will not be able to get rid of all the hardness, the remaining hardness is often quite useful when you are keeping your Discus fish in soft water; it will be a buffer. As most waters go acid in an aquarium because of pollution, etc; some hardness released by the gravel will keep it much more stable.

Why certain hobbyists like to paint the back of their tanks rather than using a picture, I can only guess. They might like the colours somewhat better than a colourful picture of either rocks or plants. I must admit that I also prefer the back and sides of my tanks to be painted rather than using a commercially available background and I have always used a dark brown paint which will give a lovely contrast to the greens of the aquarium plants.

Although Discus fish, like many other tropical fish, are very adaptable as to various water conditions; it is best to keep them in a water with a hardness of about 4 to 10 dGH and a pH of about 6. This type of water has, over the years, proved to be acceptable for the fish and they will grow well and show their colours which is always an indication that they are happy with their environment.

Suitable plants for a Discus fish tank are Crinum, various Amazon Swords, Cryptocorynes, Water Wisteria and even Elodea (because of the high temperature of the water, plenty of light). Also, in soft water it is advisable to use a good plant fertiliser and Ferrogan, an iron-based plant fertiliser which has proved to be very good. I like to see nice plants in any aquarium, but often they prove to be more difficult than the fish. A Discus fish aquarium should not be overstocked with plants because they can be dirt-traps and easily upset the balance of the aquarium.

Amazon Swords and Crypts are good "Discus" plants

A deionising unit is a unit which will remove from raw water every hardness and give you a water with a conductivity of 5 to 25 uS and a pH of about 6. There are of course many such units filled with many different types of resins. It is important therefore, to make sure that the resins used are suitable for tropical fish, as not every resin is suitable for every application.

An Oxydator would certainly be a useful thing to have in your aquarium. Not only will it make your biological filtration more efficient but it will also make your plants grow better, in fact, it will keep the environment of your Discus fish in a much healthier condition.

Finally, although there are very few books published in English on Discus fish, Gunther Keller's 'Discus' published by TFH seems to be the more up-to-date. **E.S.**

by Roy Pinks

I WAS glancing through a classic fishkeeping book the other day and came upon the injunction to quarantine the Head and Tail Light Tetra for at least 10 days, during which time the water should be coloured with methylene blue. Whilst I would in no way disagree with this caution (excepting to lengthen the period to at least a fortnight), I would just add the suggestion that such a warning should be printed in large type at the top and bottom of each page. The more I see of fish and fishkeepers, the more I detect an appalling urge to achieve instant perfection, which usually means buying everything within a week, cramming it into a tank, and blaming the dealer for the next six months that almost everything has gone wrong. Despite tapes, both audio and video, which are intended to get the beginner off to a good start, the buyer continues to be his own worst enemy. From recent personal experience I can state more strongly than usual that the longer you take to set up your tank, the more fun it will prove to be: and certainly the more successful will it turn out. I think that many people jib against a quarantine tank for two main reasons: that the process itself delays the introduction of fish to their final destination, and that the tank, by its nature, is unattractive. The first objection is valid but is a stupid reason for rejecting quarantine. The second objection is untrue, as a quarantine tank can look as attractive as any other, because the notion that it has to be a bare and medicated cell is no longer true.

Quarantine is intended to ensure that any disease carried by new fish will "out" before they are transferred to their new quarters. Even if there are no fish present in your new tank, don't on any account put unquarantined fish in it, because if disease does break out you either have to catch the victims for treatment in a hospital tank or treat them in situ. Whatever the advertisers claim about their disease cures being inimical to the well being of plants, disbelieve them, because very few such assertions are correct. What so often happens is that osmotic action causes some plants to collapse, and in some cases chemical action disfigures or destroys the leaves. You will notice that there are no money-back guarantees with these products in the event that the claims don't work.

There is no positive guideline about how long fish should remain isolated, but a fortnight is generally accepted as a good working basis. But don't hurry, especially if the fish don't look absolutely fit: if you have done quarantining properly, they should, by the end of the period, be looking like show class specimens.

How to go about it? First, acquire a tank of size and shape to complement what you already have. The lowest one on a tiered stand is very suitable. Set up an inch or so of gravel on the bottom and provide one or two easily removable rocky hideouts, placed to the sides and rear of the tank, so as not to interfere with cleaning of the glass. Pot up a number of plants in small containers and dot these around. Wisteria is a good subject, like Hygrophila species, since they have a bushy habit. When the fish are introduced, add a half dose of a wide spectrum medication as a precautionary measure.

The hideouts and the plants serve the essential purpose of giving the fish security if they feel that they want it. If you doubt this, watch the behaviour of fish placed in an unfurnished tank for quarantining and those in quarters such as I have described. The fish in the former circumstances will look pallid and nervous and will only rise to their food with jerkiness and suspicion. Those which have had a chance to shed their stress will begin to colour up, swim confidently, and to ingest food with calm and discrimination.

The mobile plan for the plants will enable you to vary the look of the tank as often as you wish, and as these and the rocks can be lifted out so easily you can remove them prior to transfer of fish (which can be caught without panic and disruption) and replace them without disrupting their growth pattern. Obviously, this policy assures you of a highly convenient plant nursery, enabling you to replace or reinforce specimens from your main tanks in cases of need.

My own quarantine tank is only a shallow one—some 10 in. deep, and this available light to help the plants on their way in a most effective fashion. Of course, you have to watch cleanliness in the quarantine tank, and how much effort you have to expend will depend on whether or not you have a sub gravel filter. It would seem to be an ideal situation for one, in fact. After each transfer of fish it is as well to siphon off at least a third of the water and to replace it with water similar to that in the final quarters. This helps to ensure that the fish are not only screened and psychologically tuned, but also got used to the type of water which they will live in (probably) for the rest of their lives.

I have just replanted my display tank for the second time in three months, and all the fish are in the quarantine tank. So far as I am concerned they look fine where they are, and if they remain there for another month whilst the plants above them put on size, I shall be quite content with the arrangement.

A-Z of the Aquarium

Goldfish

THE Goldfish is, without doubt, the best-known fish in the whole world. Because of the numerous well-known "Fancy" varieties known today, many people believe that the basic, short-finned, orange/gold form, i.e. the "Common" Goldfish, is the true wild Goldfish.

Yet, even this variety is at least one step removed from the *real* Goldfish, known scientifically as *Carassius auratus auratus*.

In most books, the Goldfish is referred to as *C. auratus*, i.e. the second *auratus* is omitted. However, the full name is given here in recognition of the existence of another, very closely related fish commonly known as the Gibel or Prussian (as distinct from Crucian) Carp, *C. auratus gibelio* (see Carps—*A-Z of the Aquarium*, June 1984).

The Goldfish, or Golden Carp, is native to China and certain parts of Siberia but has been introduced into waters worldwide. The natural coloration is usually referred to as olive-brown. Although gold, red, orange and otherwise-coloured fish may be found in the wild, these are thought to be introductions of domesticated varieties rather than true, wild populations.

The history of the Goldfish spans more than 1,000 years. Not surprisingly, much of this is shrouded in legend, myth, speculation and other distracting elements.

There is a suggestion that red-scaled fish were first observed between 265 and 316 AD, during the ancient Chinese Tsin Dynasty. If so, then the first steps towards the development of the numerous varieties known today had already taken place between 1,500 and 1,700 years ago.

Varieties are classified according to characteristics which include modifications to the head, nostrils or eyes, the shape of the body, the presence of single or multiple fins (or, their absence), the shape and length of individual fins, the colour quality and patterns on the fins and body, the nature of the scales, and so on. Since one or more of these, and other, characteristics can occur in a range of combinations, the array of Fancy Goldfish available today is nothing short of bewildering. Even so, the scope for new developments remains virtually endless. We may have come a long way but the end of the road is (happily, for most) nowhere in sight.

Red Cap Oranda one of the numerous varieties of Goldfish

Heating

THE provision of supplementary aquarium heating depends, predominantly, on the type of fish being kept. In the case of coldwater species, not only will supplementary heating be unnecessary, but it can even be dangerous.

Species such as Orfe (*Leuciscus idus*) and Goldfish (*Carassius auratus auratus*) have evolved to survive best at cool temperatures and will suffer when subjected to extended periods of high temperatures. Abrupt increases can be particularly harmful.

The main reason for this can be found in the ways that metabolic reactions respond to temperature changes (see Q10—*A-Z of the Aquarium*, December 1983). Enzymes work best within a narrow temperature and pH range. Any deviation from this will lead to a decrease in efficiency. If, further, the amount of oxygen available also decreases (as it does with increases in temperature), then stress sets in with all its nasty consequences.

Equally, tropical species have evolved to survive under a (relatively speaking) high temperature regime. Therefore, the vast majority require some form of supplementary heating. Failure to provide this leads (again) to decreased efficiency and stress.

Some "tropical" species, notably the Paradise Fish (*Macropodus opercularis*), are very adaptable and can survive quite comfortably at "coldwater" temperatures; but these are exceptions. Most tropical species require temperatures between about 22° and 26°C (approx. 72·5° and 79°F).

***Macropodus opercularis* is one of several "coldwater" species of tropical fish**

Aquarists who own large numbers of tanks in fish rooms or fish houses usually employ some form of space heating, i.e. they heat the room rather than the individual tanks. Most aquarists, though, do not own a sufficient number of tanks for space-heating to be economically practicable. Individually-heated aquaria are, obviously, the answer. The basic equipment consists of a heater and thermostat, with the heating capacity being dependent on the wattage of the heater.

As a rough guide, aquaria up to 24 in. require 10 Watts/gallon; those up to 48 in. require 6 Watts/gallon; between 48 in. and 72 in., the figure is 4 Watts/gallon.

Suggested Heating Requirements

Length of Tank (Inches)	*Approx. Wattage*
18	30-60
24	75-100
36	100-150
48	120-180
60	150-210
72	200-300

Gouramis

Some Belontiidae. (eg) *Colisa chuna*, are recognised as Gouramis—others are not

Most aquarists are familiar with those fish commonly known as Gouramis. Yet, when it comes to defining the term, numerous difficulties arise.

For a start, it is impossible to ascribe these fish to a single Family, as one can do with most others, e.g. Gobies (Gobiidae).

All Gouramis have one thing in common—the possession of an accessory respiratory organ (the labyrinth). Yet, not all labyrinth-bearing fish are known as Gouramis. Perhaps the best-known excepeion is the Siamese Fighting Fish, *Betta splendens* (see Bettas—*A-Z of the Aquarium*, May 1984).

In fact, not even all the species (or genera) in a single Family are known as Gouramis. The various *Betta* species, along with the Combtails, *Belontia* spp. and the Paradise Fishes, *Macropodus* spp. belong to the same Family (the Belontiidae) as do the Dwarf, Thick-lipped, Honey and Giant/Banded Gouramis (*Colisa* spp). Other members of the Family include the Three-spot, Two-spot, Brown, Blue, Lavender, Amethyst, Opaline (Cosby), Gold and Platinum Gouramis (all, incidentally, being varieties of the single species, *Trichogaster trichopterus*), the Snakeskin Gourami, *T. pectoralis*, the Thin-lipped or Moonlight Gourami, *T. microlepis*, the Pearl, Leeri or Mosaic Gourami, *T. leeri*, the Chocolate Gourami, *Sphaerichthys osphromenoides*, the Croaking Gourami, *Trichopsis vittatus*, the Sparkling or Schaller's Gourami, *T. schalleri*, the Pigmy Gourami, *T. pumilus*, the Liquorice Gourami, *Parosphromenus* spp. and the Mottled Pointed Tail Gourami, *Malpulutta kretseri*.

Helostoma temminki

Outside the Belontiidae, there are two further Families of Gouramis. The sole representative of the Helostomatidae is the Kissing Gourami, *Helostoma temminckii*. Some books mention a second species, *H. rudolfi*, but this is a synonym of *H. temminckii* (used to refer to the pink, as opposed to the green, variety) and is invalid.

If there is a real "Gourami", it must be the single member of the Osphromeniidae, *Osphronemus goramy*, which can grow up to around 24 inches in length. This species is believed to be the "oldest" Gourami—fossils appearing to belong to "an" *Osphronemus* have been found in rocks estimated to be 26 million years old. A final claim of this species to the title "Gourami" is that the term originally arose from the misspelling of *goramy*.

Hemiodontidae

Hemiodus semitaeniatus

The majority of aquarium books list *Nannostomus*, *Poecilobrycon* and *Hemiodus* as genera of the Family Hemiodontidae, under the common name of Pencilfishes. Some of the better books refer to a certain amount of confusion concerning the classification of these fishes. Few, if any, actually delve into the complexities of Pencilfish taxonomy.

The result is that aquarists are often presented with (seemingly) definite, categorical statements that differ from book to book and can only lead to further confusion. In addition, the lack of recognition of the various alternatives can make the tracing of a particular species difficult, if not impossible.

Although the present state of affairs is not absolutely stable, it is slowly and gradually becoming so. The following is a summary of the main developments in the Pencilfish story.

Most workers in the field have long agreed that distinct morphological features firmly place Pencilfishes fairly close to the Characins and, therefore, within the Suborder Characoidei.

However, from that point on, opinions have differed significantly over the years. At times, all 1,000 or so species were placed in a single Family, the Characidae, e.g. by Weitzman (1962) and Gosline (1971). Other workers, e.g. Berg (1940) had recognised six Families, including the Characidae and the Hemiodontidae.

Following work by Greenwood and others (1966), the whole group was split into no less than 16 separate Families. Although this may have seemed (and may still seem) excessive to some, the tremendous diversity that exists among the Characoidei probably makes Greenwood's interpretation realistic.

The implication of this classification, as far as aquarists are concerned, is that the Hemiodontidae no longer contain the Pencilfishes. Instead, there is only a single genus, *Hemiodus*, with numerous species (several of which are regarded as *Hemidiopsis* by some authorities), including *H. semitaeniatus*, the Silver or Half-lined Hemiodus from South America.

This classification places the other Pencilfishes; such as *Nannostomus*, within a separate Family, the Lebiasinidae. This, in turn, means that the "old" Nannostomidae, which is still mentioned in some books, loses its status.

Until, or unless, a better and more natural classification is developed, the above interpretation of the taxonomical position of the Hemiodontidae is likely to be the most widely accepted.

Pencilfishes are now considered to belong to the Lebiasinidae

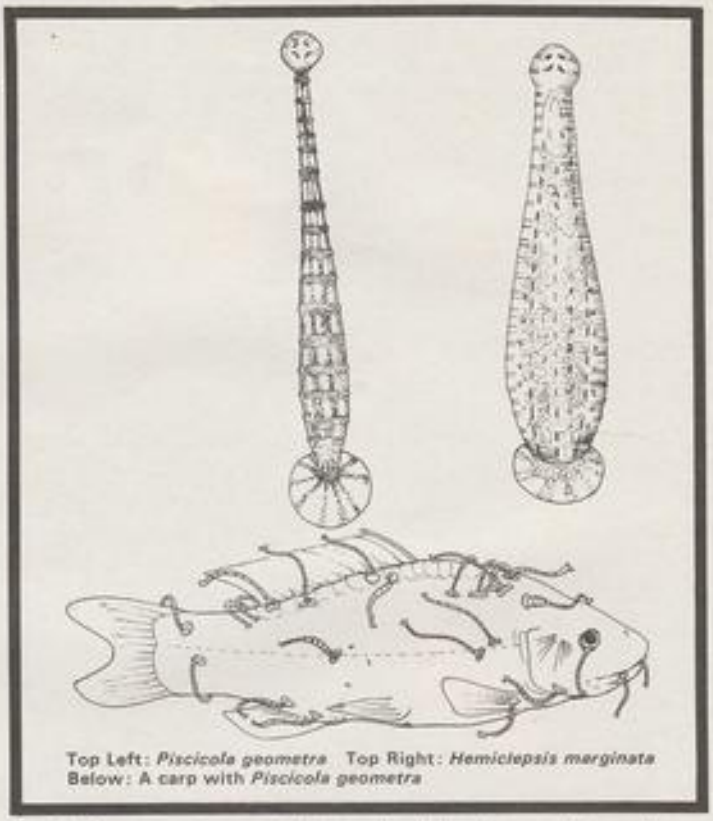
THE BASIS OF FISH HEALTH

by 'Mayfly'

Fish Leeches

LEECHES belong to the class Hirudinea of the phylum Annelida. They are characterised by the presence of a sucker at each end of the body. In the class Hirudinea, there are three orders, but only in one of them, the Rhynchobdellida, are fish parasites found. These leeches pierce the skin of their host by means of a proboscis unlike the more familiar horse leeches and medicinal leeches which have jaws. Of the 15 or so species of leeches found in Britain, only two are important as fish parasites. These are *Piscicola geometra* (the common fish leech) and *Hemiclepsis marginata*. Continental Europe boasts a few more species (*Cystobranchus respirans* and *C. mammillana*) while north America has other species of *Piscicola* (e.g. *P. salmonitica*). Tropical freshwaters have relatively few fish and turtle leeches. There are a number of species that parasitise marine fish (e.g. *Pontobdella* sp. on rays).

The common fish leech can be found on virtually any species of fresh water fish, but the carps seem among the most favoured. This leech grows up to 5 cm (2 in.) long and is more cylindrical than any other leech. Both suckers are very prominent and the animal is characterised by a greenish-or brownish-red background colour with eight longitudinal rows of white spots around the body. At the base of the head sucker there are two pairs of eyes. It is a very active animal and can often be seen making its looping movements on the sides of the tank or pond. Occasionally it can be seen swimming through the water. Once on a fish it will remain there for several days during which time it feeds on the host's blood. There are areas of the fish that are preferred sites for attachment, for example under the fin-bases, behind the anal fin and inside the mouth. These areas are where water flows are less powerful and the leech find it easier to maintain station. Leeches are hermaphrodite but cross fertilization is more normal than self fertilization. Cocoons, 1·0-1·5 mm long, containing a single egg are laid throughout most of the year. They are cemented onto the walls and bottom of the tank or pond. These hatch in a few weeks depending on temperature. Their rate of growth and the time at which maturity is attained also depends on temperature, and in warmer conditions several generations may be produced in a year. *Piscicola geometra* will survive in brackish water aquaria, although it cannot tolerate 100% sea water.



Top Left: *Piscicola geometra* Top Right: *Hemiclepsis marginata*
Below: A carp with *Piscicola geometra*

The other British freshwater leech is *Hemiclepsis marginata*. This is a much more flattened animal of a pale yellowish colour overlaid with orange, red and green spots and stripes. There are two pairs of eyes. It is 1·6-1·8 cm long and up to 1·0 cm wide and

(Continued on page 42)

Press Release

Xotic Pets become sole distributors for West German company

XOTIC PETS LTD., a specialist wholesale marine Company in Derbyshire—already well known for their revolutionary self-serve marine system—have recently been appointed sole U.K. distributors for Corallen Center of West Germany.

Available to hobbyists, via the Trade only, will be a comprehensive range of well proven marine products. These include Biofora Sea Bed, Tropical Sea Salt, Hydrocarbon, Combisan, Coral Cleaner, Corafeed marine foods and of course Corallen Center's huge range of quality dried corals and associated products.

Xotic Pets will be displaying these products and other exciting new products, including a unique range of natural frozen fish foods, at the forthcoming Harrogate Trade Show in April. More information is available from the Company at:

Unit D2, Salcombe Road, Meadow Lane Industrial Estate, Alfreton, Derbyshire DE5 7RG. Tel: Alfreton (STD 0773) 831831. Telex: 377974 XOTIC G.

From Interpet—have you seen? Mini-Size with Maxi-performance

Have you seen the amazing little Interpet Mini-Powerstreem Internal Motor Filter—the latest addition to the Powerstreem range from Interpet.

This compact filter is ideal for aquariums from about 50cm to 1m and sells on sight for under £15 including VAT.

Amazon Swords

Have you seen the latest addition to Interpet's range of Plantastic plants—the Plantastic Amazon Swords?

These are available in three sizes, which retail from £1·73 to £3·98 including VAT.

Left to Right: Deputy Lady Mayoress and Deputy Lord Mayor of Bradford with Keith Barraclough and Gordon Holmes

King British a 15 year Yorkshire success story

WHEN the Deputy Lord Mayor and Deputy Lady Mayoress of Bradford formally opened the new extension of the Hayfield Mills, Bradford premises of King British Aquarium Accessories Company Limited on 27th April, it marked a significant stage in the company's successful development.

It was back in 1965 when two former aquarium shop owners, Keith Barraclough and Gordon Holmes came together in a business venture importing and distributing fish and equipment as well as running a specialised retail shop.

Since then that venture has grown into the highly successful King British organisation which, with its associated companies, is one of the country's recognised leaders in the development and supply of flake fish foods, medications, accessories, filtration and purification equipment for home and export markets including the Far East, Australian, Europe and America.

Moreover, the company has the facilities to handle some 2·5 million live fish annually ranging from goldfish to piranhas and rarely are there less than 50,000 on the premises at any given time. Indeed, King British claim to be the only large scale UK fish food manufacturers who actually keep livestock as well.

Today the company runs its extensively computerised office production, storage, glass stock and laboratory departments from some 20,000 square feet of space including the new extension which was essential if King British was to keep pace with growing customer demand for its products and services. Its 31 strong staff team are kept busy meeting the demands from an expanding annual turnover in excess of £1 million, a third of which is accounted for by fish foods developed at Bradford.

Commented Keith Barraclough, chief executive: "Ours may be a highly specialised business but it also has to be a highly efficient business if we are to continue our successful expansion in the UK and world markets.

"It is our abilities and proven track record that keep us at the top in the specialist aquatic world. We cannot learn enough and indeed both Gordon Holmes and I make regular field trips to world locations such as South America, Malaya, West Africa and the Caribbean to study fish in their native environments and get a better understanding of their essential needs and requirements.

"This knowledge we re-apply here in Bradford with our own massive stocks of fish which provide the ultimate in on the spot environmental testing. The result is the best possible products of the best possible variety".

Keith Barraclough's position in the aquatic world was recently underlined by his election to president of Ornamental Fish International, the worldwide organisation of importers and exporters of ornamental fish and aquatic plants.

For further information please contact: Keith Barraclough 0274 576 241 or Bob Rushton 01 404 5575.

aquarian Fishkeeping Exhibition '84

Roy Hart (Hounslow) receiving one of his prizes from Laurie Raper, general manager of Thomas's of Halifax

THE First **Aquarian Fishkeeping Exhibition** took place between Friday 8 June (restricted to judging of fish and tableaux) and Sunday 10 June at Kempton Park Racecourse.

This event marked the culmination of a long-standing agreement between the Association of Aquarists and Aquarian to stage a major show in the south of the country. As we all know, such an occasion has been sadly lacking since the disastrous fire at Alexandra Palace some years ago.

In short, the result was a resounding success for all involved, and this included the traders.

Aquarian have asked us to express their sincere thanks, to all traders who brought their fish, plants, wares and equipment and who did so well (as the empty and nearly-empty shelves testified):

Essington Aquatics, J. M. C. Aquatics, Sarogny Products, Ornamental Wood Supplies, L. M. B. Aquatics Ltd., Aquatic Life, Airport Aquaria, Aquarist and Pondkeeper, Willowbank Aquarium Products Ltd., Anglo Aquarium Plant Co. Ltd., Sicce, Tahiti Aquariums, Aqua Tec (Fischer), House of Broomfield, Aquatic Wholesale Supplies, Keith Barraclough (King British), Impelec Ltd., Crawley Aquaria and D. H. Eccles.

In addition to the traders, there were, of course, marvellous and ingenious tableaux, some of which showed a very welcome, instructive, colourful and interesting departure from the "norm". Judging of these tableaux was carried out by Dr. David Ford, John Dawes and Chris Knight. Their approach towards the way in which the fish (which had already been judged for individual merit) were integrated within the overall theme of each tableau may well pave the way for further developments in the creation of tableaux as *total concepts* in the future.

With so many top flight aquarists competing to become the first-ever winners of the event, the quality of the entries was extremely high indeed and the quantity, equally impressive.

It was also very pleasing to see the following Specialist Societies in attendance:

Anabantoid Association of Great Britain, British Killifish Association, Catfish Association of Great Britain, Southern Livebearers Aquatic Group and, on a different but very welcome note, the Cacti and Succulent Society.

In addition, there were two stands from Aquarian, one situated at either end of the hall, where free samples of food and literature were available. This was backed up by on-the-spot advice from the Company's salesforce and from John Dawes and David Ford.

John and David were also responsible for the weekend's lectures, each giving two on the Saturday and two on the Sunday. The Sunday lectures were particularly well attended (more than 90 people were counted at one of these).

Aquarian report that over 5,000 people passed through the turnstiles, despite the strong competition afforded by the glorious weather. They seemed well pleased—so did the traders—so did the Association of Aquarists—and last (but by no means least) so did the visitors.

Staging *any* Show is a fraught, difficult and draining experience, only made worthwhile when results match expectations. Viewed in this way, the organisers of this year's exhibition should be well satisfied with their efforts.

Competition results will be published in our September issue.

UP-DATE ON ANABANTOID FISHES

by Dr. R. J. Goldstein

DURING the past few years, Anabantoid fish interest has blossomed in both Europe and the U.S. New and previously unseen fishes have been discovered and almost as quickly introduced to the hobby. A number of aquarists and other workers have been intimately involved in this progressive growth of species and information. But let's look at where we are today.

In the commercial sector of the hobby in the U.S.A., all progress has been of the worst kind, with the introduction of new colour forms of ordinary species such as the gold gourami from the blue (and the Cosby from the blue before that), and the new sunset et al. strains derived, so it is reported, from dwarf gouramies, but resembling *Colisa chuna*, the honey gourami. Why this should create a stir is beyond me, but now we also have introductions of colour intensified dwarfs, and these are getting new names. The entire domestic, commercial gourami market is becoming cheapened with flash while, at the same time, series importations of desirable fish, even those that have been in the hobby for years, seem to be declining. Thank heavens that the hobby doesn't depend on the commercial supply for its progress.

In Europe, other activities were occurring that were to have a profound affect on the hobby. Jorg Vierke, an anabantoid specialist, joined with several well-known European aquarist-scientists in a series of expeditions to southeast Asia, including the countries of the Malay Archipelago, for the purpose of investigating reports of new bettas and other labyrinth fishes. The outcome of those years of expeditions, study and importation was Vierke's book, *Labyrinthfische und verwandte Arten* (Engelbert Pfriem Verlag, 5600 Wuppertal-Elberfeld, Else-Lasker-Schular-Str. 47-49, West Germany, DM 58). Vierke included fishes with labyrinth organs, whether or not they were all related, and clearly described and illustrated the organ and its importance, tying in a series of beautiful photographs of these non-anabantoid fishes in the process. More important, he also provided some of the first excellent quality photographs of little-known or previously unknown anabantoid fishes. His treatment of the anabantoids follows his previous belief in the use of behavioral characteristics in taxonomic delineations. Thus, he removed the spike-tailed paradise fishes, *Macropodus cupanus cupanus* and *M.c. dayi* from that genus on the basis, largely, of behaviour and included it in a genus that has not been considered valid in some time, the genus *Pseudosphromenus*. There are other changes and, in several cases, questionable conclusions that will make many aquarists lift their eyebrows. Whether they are important or significant is not the point: the point is that someone has taken a fresh look and presented a new analysis for criticism. My purpose in this article is not to criticise that analysis, but to report its existence.

At about the same time, German aquarists were providing stock of these new fishes to Canadians and the Canadians were providing them to Americans. Most of the activity in the U.S. was occurring through the efforts of a very few people, including Dr. Sur Liebetrau, Dr. Sally Boggs and Dr. Dan Fromm. Some of the most significant events included reports of new bubblenest building bettas and the first modern importations of mouthbrooding bettas to aquarists, rather than publishers, in the U.S. With regard to the bubblenesters, there is some question as to whether *Betta imbellis* is a valid species or merely a wild form of *Betta splendens*. The jury is still out, and people with this form are advised to maintain their stock isolated from *B. splendens*. While that same question has been raised for *Betta smaragdina*, in my opinion there can be no doubt of the validity of this species based on the coloration of females, which in no way resembles any form of *B. splendens*. A very beautiful, new bubblenester recently to enter the U.S. is *Betta coccina*, a ruddy fish with a large, iridescent green blotch on the middle of the side. And there are more species as well.

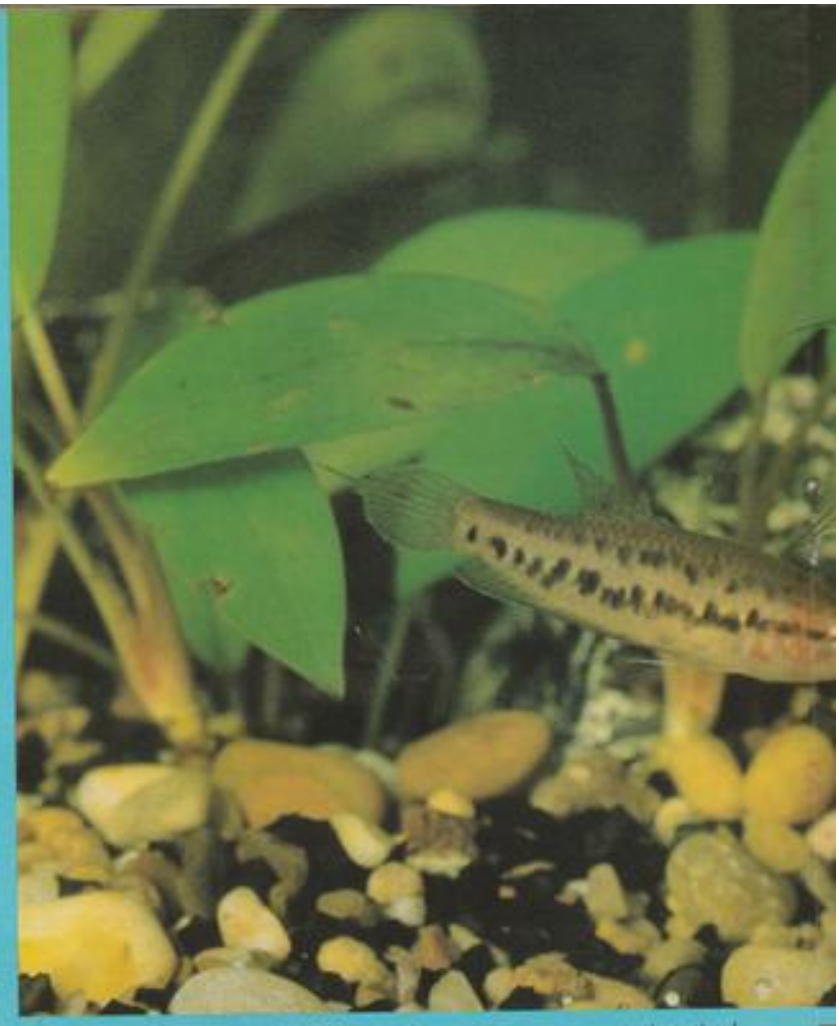
On the side of mouthbrooding, the first fishes to come into the hobby were *Betta picta*, *Betta trifasciata* (and these two might or might not be identical) and the gorgeous *Betta pugnax*. I believe *Betta picta* is distinct. Males have a purple edge to the anal fin which is very prominent, while photographs I have seen of *B. trifasciata* don't even suggest such a marking. *Betta picta* is a gentle mouth-

brooder. I have some dozen and a half young from my first spawning, after which the female was lost due to faulty water conditions. These fish are normally sized for bettas and not very distinctive, so they probably don't have a commercial future.

This brings up to another important consideration regarding all the new bettas, something that may not have been noticed before on *B. splendens*. All these fish require exceptionally high quality water, coming from highland streams rather than stagnant lowlands. In addition, they are jumpers capable of exiting the smallest opening in the cover glass of an aquarium. Keep that in mind if you get a chance at keeping some of these rarities.

Betta pugnax, unlike *Betta picta*, is spectacular. As large as a rift lake cichlid, this brown-gray fish is overlaid with huge, iridescent blue-green plate-like scales on the head, extending onto the sides of the body. Also non-aggressive, these fish can be kept in groups, but are a bit more trouble to keep. Because of their size, they should have special feedings of small earthworms. They gorge on the new "blackworms" in the hobby. (I have not been able to get an identification on these large, tubificid-type creatures). I witnessed one unsuccessful spawning, in which there was a single embrace and the female ate the eggs, making no attempt to pass them on to the male for oral incubation, the normal course of events.

Most of these species have been available through specialized aquarists in the International Betta Association (IBC), but that group is more interested in selective breeding of *B. splendens* than in newer species or in mouthbrooders. In any case, you can find considerable information on these species. See "Mouthbrooding Bettas," by Sally Boggs in the U.S. magazine, Freshwater and Marine Aquarium (FAMA) For September 1981, and "The Wild Bettas," a series by Sue Liebetrau in FAMA January through July of 1982.



In 1980, another European anabantoid book appeared, this one somewhat less expensive. Horst Lineke's *"Farbe im Aquarium Labyrinthfische"* is available from Verlagsauslieferung Schreiner, Postfach 1945, 4432 Gronnau, West Germany (DM 22). Very similar to Vierke's book in organization and in the maps that accompany the species accounts, Linke and Tetra (the publisher) have essentially taken Vierke's work and made an inexpensive copy for the lower price market.

Finally, there is an East German anabantoid book also available, but I prefer not to report it until I receive my copy, which was paid for some time ago!

I am happy to report that the new Anabantoid Association of Great Britain has made me an Honorary Vice-President, and is sending me back copies of their publications. That will enable me to keep up with British advances in this area. I can already report that this group has *Malpulutta kretseri* circulating in the tanks of aquarists, and I plan to get some for introduction to the U.S.

Finally, there is an effort afoot to begin an Anabantoid Association here in the U.S. to do the job which the founders don't believe is being done by IBC. If you are interested in getting in on the ground floor of this beginning group, drop a line to Mike Kulp, 1319 Rialto Lane, Santa Barbara, CA 93105 USA.

Malpulutta kretseri

Betta splendens

Betta pugnax

Macropodus opercularis **kept as an aquarium fish in Europe since 1869**

African Labyrinth Fishes of the Genus Ctenopoma

(Copy supplied by Anabantoid Association of Great Britain)

THE family Anabantidae, within the suborder Anabantoidei, contains three genera. There is *Anabas*, widely distributed throughout South Asia, with two species, *A. testudineus* and *A. oligolepis* and *Sandelia* from South Africa with three species, *S. bainsii*, *S. capensis* and *S. vicinia*. Finally, there is the genus *Ctenopoma*, from Central Africa, with over 40 described species. The latest, *C. ashbysmithii*, a dwarf with 13-15 dark bars on a bronze body, was described by Banister and Bailey in 1979.

The zoologist, G. A. Boulenger, combined *Anabas*, *Ctenopoma*, *Sandelia* and *Spirobranchus* (=*Sandelia*) and, despite corrections by Regan, Myers and Barnard, the use of *Anabas* in its all-embracing sense was used even into the 60s in the hobby. The scientific genus name, *Ctenopoma* refers to the comb like gill cover which this genus possesses (Those of *Sandelia* are smooth). They are sometimes known popularly as 'Climbing Perch', but this name should strictly only be applied to *Anabas*. A more appropriate name for them is 'Bush fish', coined by Dr. W. Ladiges, which refers to their habitat, quiet waters with dense vegetation.

There has been interesting speculation by Lothar Seegers that the ancestors of the African species gave rise to the host of Asian anabantoids (gouramis and so forth) by migrating across the land bridge that once existed between East Africa and Asia but Dr. J. Vierke has shown it is more likely that the African species evolved from ancestors of *Anabas* once the continents had separated through continental drift.

Some of the Ctenopomas are typical predators with pointed mouths and deep bodies, vaguely resembling Leaf Fish, while others are more streamlined, with longer, shallower bodies, more adapted for flowing water or bottom living. They resemble cichlids more closely than gouramis and have none of the thread like ventral fins of most of the Asian anabantoids. By reputation they are shy, predatory fish, that lurk in the vegetation waiting for prey, the larger species consuming small fish, the smaller ones subsisting on insects and their larvae. Many of the books would also have you believe they require temperatures above 24°C (75°F) and their aggression precludes the possibility of keeping them with other fish. However, there is no substitute for personal experience and this proves many of these generalisations are incorrect. One thing the literature agrees on, though, is that the supply of these fish is severely limited and this, at least, is a justified observation which largely stems from the fact that most of the fish reaching the aquarium shops are imported from Africa.

There are two distinguishable groups within the genus. Some of the fish are easily sexed on the basis of the longer, more pointed finnage of the male and these species build a bubble nest and the males show parental care of the eggs and fry until they are free-swimming. Species in this group include *C. fasciolatum*, the Banded Bushfish, *C. ansorgei* the Orange or Ornate Bushfish, *C. nanum*, the Dwarf, and *C. damasii*, the Pearl. In the other group the fish behave more like *Anabas*, spawning without building a nest, often close to the base of the aquarium and show no parental care. In this group the sexes are not easily distinguished; however external sexual differences in this group were discovered by Professor H. Peters. Apparently, just behind the eyes and on the caudal peduncle there exist small areas where the edges of the scales are decorated with spines. In the male they are very pronounced, allowing him to hold the female securely during the spawning embrace. Some of the streamlined *Ctenopoma* such as *multispinis*, *machadoi*, *nigropannosum* and *pellegrini* only have the spines near the tail. Other members of the

group include *acutirostre, ocellatum, oxyrhynchus, argentover, murei* and *kingsleyae.*

It is dangerous to generalise, but most of the Bushfish prefer a high protein diet. The very large species will eat slow-moving fish, chunks of offal, catfood, worms or trout pellets, while the smaller fish will be content with Tubifex and Daphnia, frozen and freeze-dried offerings and even flake food, although it is advisable to feed the latter exclusively. Horst Linke says that in his trips he found the fish in West Africa survived in clean and clear, frequently flowing, soft acid waters at 24-28°C (75-82°F). However, the fish are usually hardy and are often kept below 24°C (75°F), to save energy costs, and do well at a range of pHs. Some species have been spawned successfully and the young should be raised as Gouramis, using infusoria for 1-2 weeks and, thereafter, daphnia and brine shrimp, taking special care to exclude draughts and ensure the water surface is clean during the period the labyrinth organ is forming. For breeding the fish the primary requisite is patience as many species take several years to mature.

Whether it is a sign of things to come, I cannot tell, but early this year several species of *Ctenopoma* were imported simultaneously into this country and, for once, were distributed quite widely. It is likely that some of these will reproduce, increasing the availability and the interest in the next year or so. This may be a good place to consider some of the commoner species in greater detail, therefore.

The Free Spawners

C. acutirostre, the Spotted or Leopard Bushfish, gets its name from the large, dark spots that decorate its fawn body. Juveniles at about 2 ins. (5cm.) are fairly regularly available. They often appear very shy and frail in dealers' tanks but very quickly put on weight and become quite bold when transferred to a favourable environment. Here they will spend much of their time drifting sedately amongst the vegetation. They will ultimately achieve a size of about 6-8 ins. (15-20 cm.) and adults will often develop a much darker body so the spots are almost invisible. As the large eyes and pointed mouth suggest, they are mainly nocturnal predators and in nature are found in hollowed out areas of vegetation in the Congo River area of Zaire. There is only one record of breeding, at the Basle Zoo, in 1982. The adults were about 10 years old, but, unfortunately, the spawning was not observed. The event was only realised when 1 in. (2·5 cm.) youngsters materialised in the 8 ft. 2 in. × 6 ft. 5 in. × 5 ft. (2·5 × 2 × 1·5 m.) tank where the fish were kept at 26°C (79°F).

C. kingsleyae is, perhaps, the commonest species in cultivation and the cheapest to obtain. It is a grey-brown or grey-green colour with a fine silver chest and a spot at the base of its tail which gives it the popular name, tail spot Bushfish. In contrast to *C. acutirostre,* this is an aggressive, strongly swimming active fish with an elongated body. Don't be fooled by the size of the juveniles offered for sale, this fish will grow to 8 in. (20 cm.) and create havoc if placed in too small a tank. However, they will hold their own in a large tank with similar size fish. They will eat anything their mouths can accommodate and present no cultural difficulties with regard to water quality. They come from coastal West Africa where they inhabit ditches as well as lakes. They have been bred in captivity and produce a thousand or so eggs which float among the surface plants. The parents should be removed as they will eat the eggs which hatch after 36 hours at 24-26°C (75-79°F).

C. oxyrhynchus is the Peacock-eyed or Marbled Bushfish. It grows to only 4 in. (10 cm.) and, although it shares the body shape of *C. acutirostre,* it does not share its nocturnal habit or quiet disposition. The body pattern alternates with mood between an attractive deep brown marbling to a uniform tan with a single large dark blotch in the middle of the body. The fins are edged in black. It has spawned fairly regularly in Europe and does so in a similar manner to *C. kingsleyae.*

C. ocellatum, the Chocolate Bushfish, resembles *C. acutirostre* in size, shape and behaviour but the chocolate-coloured body is marked with transverse wavy bands. It occurs alongside *C. acutirostre* in the Congo River system but there are no reports of it spawning yet.

The remaining species of free spawners are rarely seen. One of them, *C. multispinis,* is reported often as a mouth brooder, but this has been disproved by Professors Benl and Foersch.

The Bubble Nesters

Ctenopoma fasciolatum reaches 3 in. (8 cm.) and possesses black transverse bands which intensify when the fish is emotionally roused; these have gained it the name Banded Bushfish. It comes from the soft acid waters of the Congo. It doesn't seem to be imported as often as some of the other species, but spawns regularly in the aquarium and supplies in this country seem to have been maintained in this way. The male is easily distinguished by his elongated finnage. At 26°C (79°F), he builds a bubble nest under floating vegetation, gently nudges the female toward it and then the pair will embrace several times, the male wrapping himself around the female in the usual anabantoid way, although the female is not inverted. The eggs float into the nest and hatch after about one day, eggs and

Ctenopoma acutirostre

fry are not initially attacked by the adults. The fish I possess, resulted from a spawning by adults belonging to Chris and Denise Brook in early Spring 1982. My fish first spawned in September 1983 and again in March 1984, producing several hundred eggs. Other fish from the same brood as mine spawned when they were less than one year old.

Ctenopoma ansorgei is a spectacular fish that comes from Southern Cameroon, Central Congo and the Chiloango River system where it lives in overgrown shores of small streams in soft, acid water. When aroused this fish shows dark, black bands against an orange background, giving it its common name of Orange or Ornate Bushfish. They only grow to 3 in. (8 cm.) so are really quite small. Initial imports from Africa often seem difficult to establish; total losses of many wild caught batches have been reported to me. However, home-bred specimens and fish that survive the first week of captivity adapt well to aquarium life and are not too fussy about water conditions, although they seem to prefer warmth. As young fish, they are voracious feeders; the water almost boiled as

Anabas testudineus

I fed my first batch of newly-imported young fish with Tubifex and they would lie on the bottom of the tank afterwards, their flanks bulging. As they grow older they frequently display to each other, exhibiting their magnificent colours, but later become more reserved and perhaps need a bold fish in their aquarium to bring them out of their hiding places. Martin Cain has described the male building a nest under a broad leaf. The eggs hatched after 24 hours and the fry became free-swimming after 3 days at 25°C (77°F).

The fish described in this article are a fraction of the described species and the exact relationship to the Asian anabantoids remains a mystery currently being studied at Oklahoma University by Philip Norris under the ethologist, Dr. Rudolf Miller. There is still much to be discovered about *Ctenopoma* and the observations of aquarists should play a full part.

by Eric Hardy

How do shore-crabs wind up the internal "clock" which keeps their movements constant to the tidal rhythm after being "set" by intertidal temperature, salinity and other factors? The National Environmental Research Council has granted £28,673 to Prof. E. Naylor of Bangor University College to study the crab's physiological clock and see what secretions its nerves stimulate to effect this, for three years up to September 1985. This will be done with continuous automatic recording of crab-movements using infra-red sensors recording on electronic recorders, printing the information out at pre-set intervals. Micro-surgery on anaesthetized crabs will study their physiological clock's mechanism.

Other research projects include telemetric observations of pike in local lochs and rivers by an Aberdeen University zoologist; immunology studies of eye-fluke parasite Diplostomum in salmon and coarse fishes; colour vision in fishes by a Bristol University zoologist and the feeding biology of the common goby by Dr. P. J. Miller, a Bristol University biologist whose earlier student studies of shanny near Liverpool I mentioned in these notes just 30 years ago. A Lancaster University biologist is working out how trout cope with chloride in neutral and acid waters while a Manchester University biologist is studying how a perch sees its prey in order to catch it.

London Zoo Aquarium

Specially cooled tanks in London Zoo's 60-year-old aquarium received a large number of salmon-parr last year from artificial spawning from the first mature salmon to colonize the recently restocked and cleaned-up Thames. Its recent annual report mentions two octopuses, the Mud-flat and the Yucatan, bred in captivity in Texas which quickly overcame the idea that octopuses in aquaria are allergic to human spectators. These quickly accustomed themselves. They are among the few octopuses with large eggs and non-pelagic young. Customs gave them many small tropical fish confiscated from tourists who were not correctly following regulations!

Because most reptiles naturally lose a high proportion of their young, and survival in captivity averages less than half their normal life-span, the Institute of Zoology, the Zoo's research department, is investigating the role of vitamin D and ultra-violet lamps in keeping groups of iguanas. They've found a need for ultra-violet light by the rapidly-growing young iguana. Now they are studying its precise effects on bone-development. Out of 355 reptiles and 97 amphibians last year, 171 reptiles, but apparently no amphibians, were born or hatched in the collection.

Fish handling

Transporting live fish, to a pond for instance, raises several problems. Naturally they must first go into quarantine to safeguard against introducing roach disease, or other troubles. The temperature of the container water should be within a degree of that of the pond—by gradually mixing the two waters until it is right. Heavy mortality among rainbow-trout in a new water is often because this is neglected, especially in winter if fish acclimatized indoors are liberated in cold outdoor water. Shaking in transit is also to be avoided. Not all fish transplant so easily as tench and perch, which I've merely wrapped in pond-weed inside a large biscuit-tin and brought home on the back of a bicycle, with no more water until they were turned into the tank.

As many fish are covered with slime to reduce the surface resistance between themselves and the water, so they should not be handled, but netted, in case slime is removed.

Pugnacious male Bettas and piranhas travel peacefully together under the tranquilizing effects of tricaine-sandoze or other anaesthetics. Americans started anaesthetizing fish before removal from salmon and trout hatcheries, to make handling easier. Sandoz Pharmaceuticals of Hanover, New Jersey and London produced low cost Tricaine in 1957. It has the same value when handling other cold-blooded animals like amphibians. It is useful for quietening fish to be netted for counting, or sorting in a fish-shop. Anaesthetized fish use less oxygen in respiration so larger numbers can be transported in smaller space. It is most practical when used in conjunction with oxygen. So many as 500 goldfish travelled successfully by parcel post for 48 hours in closed plastic bags of 2 gallons of water under a Tricaine-oxygen combination, where neither alone sustained them so long. Some care is necessary to regulate length of immersion to the concentration of the drug, known as MS222 Sandoz.

Pugnacious fish which normally have to be packed in separate containers can save time and expense in the same water under sedation if the Tricaine is used at the rate of 0·14 gr per gallon of water, for goldfish shipped with oxygen, or only slightly higher to

Aggressive species, such as Piranha, can travel together while under sedation

make them inactive. They soon revive to normal activity when placed in fresh water—in a few hours after the lower concentration. They must be revived after 10 to 15 minutes immersion in the stronger doses.

This tranquilizer is sometimes known as MS-222 Sandoz, metacaine or methacaine and methanesulphonate. Its effect varies somewhat with different fishes according to their vigour. 1/10 or 1/20 gram in 1 pint of water is sufficient for barbs and characins for instance, one hour's immersion. Too much of course would kill a fish, slowly and painlessly. It is a white powder dissolving quickly and transparently in water and is harmless to humans and plants.

It is of course different from using anti-bacterial and anti-virus antibiotics to cure fish-diseases. Liverpool University vets were the first to use penicillin to cure an infection in young axolotls over 30 years ago, by adding 10 units per millilitre of water for 24 hours, or 44,560 units/gallon.

Twice the dose was used for treating edible frogs. Some of these antibiotics are only available on a prescription from a vet.

A Letter of Appreciation

I am 87 years of age, and just recovering from a rather bad spell of pneumonia. A friend has sent me a get well card, and the January issue of *The Aquarist*. This is the first copy of the magazine I have seen since the war, although I was a subscriber from 1926 till the outbreak of the war. It has come like a breath of fresh air to me. I had my early copies bound, and when I formed the Canterbury society in 1949 these books were the foundation of the club library. During the past week I have been allowed up for a few hours daily, and I have watched my community tank with the same fascination that I watched my first goldfish in 1902.

I was given my first tropicals in 1928. I had no electricity so kept them in a small tank with a zinc bottom and a lamp underneath. Paraffin oil then cost 4d. a gallon. Best wishes to you and your publication and thank you for the uplift you have given me.

Arthur Albury, Canterbury.

Goldfish as prizes?

I fully agree with Miss Christine Bragg of Newquay that we should protest about the practice of giving goldfish as prizes at fairs etc.

Is it surprising that so many die soon afterwards considering the appalling treatment meted out during their brief, miserable lives?

As a captive animal the goldfish is entitled to protection from cruelty and neglect under the Protection of Animals Act 1911, and following public protest some local councils have barred stalls offering goldfish as prizes from local fairs and fetes.

This enlightened attitude is welcome and compares very favourably with the council which allows the confinement of two young male Orcas in a disused swimming pool at a holiday resort. What will happen when these immature killer whales grow and isn't it unethical to keep such creatures in captivity?

A recent report shows that captive dolphins suffer stress caused by a lack of privacy from each other and the vast numbers of spectators. In the U.K. there have been no successful pregnancies but a depressing number of deaths, and as yet there are no legal requirements for keeping cetaceans in captivity.

We should all protest at the exploitation of animals for profit and perhaps the younger readers especially will give thought to the price so many freedom-loving creatures pay for our entertainment.

Hilda Allen, Peterborough.

Help Wanted

Do you keep tropical marine fish? If so, then Dr. Elizabeth Wood would very much like to hear from you. She is interested to know which types of marine fish are most commonly and successfully kept by the hobbyist. The information is urgently required to complete a survey which will help to identify some of the problems relating to marine fish keeping. *Your* involvement will be a positive contribution to the success of the survey! Would anyone willing to help please send their name and address to **Dr. E. Wood, Hollybush, Chequers Lane, Eversley, Basingstoke, Hants RG27 0NY.**

SPOTLIGHT

the Emerald Fighting Fish

(*Betta smaragdina*)

by David Armitage

(Anabantoid Association of Great Britain)

SEVERAL years ago we first heard of a new, colourful and most importantly, peaceful species of *Betta* which was discovered and described by the Germans. Since this time few specimens have been available through the usual retail outlets. However, increasing numbers have been bred by a few pioneering souls in Britain and the fish should be more widely available before long.

The time has perhaps come therefore to discuss this fish in more detail. It was discovered by Dieter Schaller in 1970 and described by Dr. Ladiges two years later. Smaragd is the German word for emerald, hence the specific name of this fish and also its popular name of emerald fighting fish. Although its Latin name is difficult enough to get one's tongue around it is a distinct improvement on the native name, 'Pla kat Lug badab'. It lives in a limited locality in North Eastern Thailand and its occurrence overlaps the northernmost range of *Betta splendens*. Horst Linke discovered that *B. smaragdina* was also used as a fighter by the locals which rather contradicts its peaceful reputation. Like so many of the small Asian anabantoids this fish lives in small weedy ditches and streams, swamps and rice paddies. They are washed out of these in the monsoon floods and become isolated in these little water pockets again when the waters recede.

The emerald fighter very much resembles the wild type of *Betta splendens* in body form, although appearing more slim with altogether finer body contours. Initially, the similarity with *B. splendens* led Drs. Roloff and Ladiges to believe *B. smaragdina* might only be a race of the former. However, hybrid crosses were of low viability and vitality and these experiments, backed by chromosome studies by Dr. Grimm of Hanover, confirmed that this indeed was a new species.

Words cannot adequately describe the beauty of this fish and here reference should be made to the photo by A. van der Nieuwenhuizen. The basic colour of the mature, displaying male is wine red, the individual scales on the body being picked out in emerald. The ventral fins are also red while the anal, caudal and dorsal fins alternate between red and, depending on the lighting, blue or emerald. The pattern in the dorsal fin is a honeycomb, that in the caudal, striped while the pattern in the caudal is a radiating one. The female is also quite intensively coloured but her fins, of course, are much shorter. Additionally, when exhibiting intense emotions of arousal or fear she will show two stripes that run the length of her body. The first runs through the eye to the caudal and the other runs below this. The female can also be distinguished by the 'egg spot' on her genital opening, as with all the Bettas. The male grows to about 7cm while the female only reaches 6cm.

Because of his relatively peaceful nature, the male *B. smaragdina* can be kept with two or three females in a 10 gallon tank but twice this volume will be needed if two males are to be housed together. The tank should be planted for about half its area and there should be floating plants of some description at the surface. A few stones amongst the rooted plants will provide good hideaways from the over zealous male. Most importantly, the tank should include upturned flowerpots, coconut shells or similar cavities because this fish seems to prefer to build a bubble nest under a concave surface, although nests have also been recorded at the water surface. A temperature of 25°C and relatively hard water will suffice to maintain the fish, but temperatures 1-3°C higher and soft, neutral to acid waters are really necessary for successful breeding. A little live or frozen food should help fuel this activity.

The male builds a bubble nest about 2cm high and 5-6cm across. Following his display, and with a little violent encouragement, the female follows him to the nest where the usual anabantoid embrace occurs. The female takes a more active part in the proceedings than does the female *B. splendens*, indeed a ripe female will even build her own nest in the absence of a male. She also helps retrieve the eggs which sink after fertilisation but is driven away by the male

once spawning is complete. A spawning may produce anything from 100 to over 400 eggs which will hatch in 24-40 hours to produce the tiny larvae which will be free swimming in another 2-3 days. Once they have used up their egg sacs the fry should be fed on fine infusoria, 'Liquifry' or 'Infusyl' with brine shrimp being offered as soon as they can take them, followed by Grindal worm, chopped tubifex etc. After about a month the youngsters will have reached about 1cm.

Certainly, the maintenance of this species seem a lot less fraught than that of *B. splendens* and this should encourage more aquarists to keep and breed them once they become widely available. Hopefully, their experiences will expand our knowledge of the species.

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The Basis of Fish Health *(continued from page 26)*

cyprinid (carp) fish are the preferred hosts. Unlike *Piscicola* the eggs, which are laid during the summer months, are retained until they hatch under the ventral side of the parent. They are less commonly found on fish compared with *Piscicola* as their feeding lasts just a few hours, after which they drop off the fish.

The pathological effects of leeches on fish vary considerably. The most common symptom is the leech mark where the sucker has adherred to the skin and the proboscis has penetrated it. A small red area can be seen which acts as a focus for a local myxobacterial infection, a site of entry for systemic bacterial pathogens or the means by which *Saprolegnia* becomes established on the fish. The local destruction of epidermal cells by physical suction combined with the toxic effect of the anticoagulant injected by the leech, also encourages secondary infections. More seriously the removal of red blood cells creates an anaemia which itself renders the fish more susceptible to these infections. The severity of the anaemia varies according to the size of the fish and the number of leeches present. In heavy infections the anaemia shows up as emaciation, sunken eyes, rapid breathing and increased nervousness. These may be the only symptoms seen in pond fish as the good camouflage of the leeches, together with their preference for less exposed sites on the fish, make the sighting of the leeches themselves difficult.

One of the most insidious effects of leeches is their transmission of other fish parasites. Blood parasites (*Cryptobia* and *Trypanosoma*) have a life cycle that involves fish and leeches. Both animals are needed before the life cycle can be completed. That leeches are perhaps more prevalent than is normally supposed is suggested as approximately half of all wild fish sampled in the south of England have these blood parasites. Numbers of trypanosomes exceeding one million per cubic centimetre of blood have been recorded in these fish. Anaemia, glucose depletion and protein depletion of the blood and changes in white blood cell counts have all been reported from trypanosome-infected fish. The spread of these blood parasites to pet fish is, of course, only likely when native fish and cold water exotics and leeches are mixed or when weed containing infected leeches is brought into ponds or tanks of cultured fish. However, more serious is the importation of fish with blood parasites that are not native to Britain and unknown in our populations of domestic goldfish and koi. In the last two years at least one batch of goldfish from the Far East has been decimated shortly after arrival in Britain by a species of *Cryptobia*. Such parasites are normally left totally unaffected by the administration of normal parasite treatments (formalin, malachite green, methylene blue, etc.) that are given by the more reputable dealers during their quarantining period.

The elimination of leeches to avoid or minimise all of the above problems is obviously desirable. Removing individual leeches with forceps is perhaps the most common method, but this is time-consuming, relatively inefficent and may damage fish. Lysol dips (1/5,000), salt baths (25/1,000) and organophosphate treatments are the major chemical methods and a combination of these may be necessary to effect a complete cure. The precise timings and dosages for these treatments depend upon circumstances and are referred to in more detail in the article on 'Treatments' which follows later in this series.

Coldwater Jottings

by Frank W. Orme

THE warm sunny spell during April/May appears to have taken most goldfish breeders by surprise. From initial reports it seems that the goldfish began spawning after very little pre-conditioning, and I heard of one breeder who had to cope with the results of six spawnings which all occurred on the same day. Well, at least, it made a change to hear of so many successful spawnings, for during recent years I have become accustomed to breeders reporting difficulty in obtaining early breeding from the chosen pairs, and/or poor or infertile eggs. Hopefully, many of these young fish will appear in the breeders classes at the specialist open shows during this month and next.

Of course, being unprepared for a spawning can pose some feeding problems—especially for the inexperienced aquarist—when it comes to the provision of suitable food for the young. I had a telephone call from a young fishkeeper who, in rather a panic, informed me that he had put his pair of fantail goldfish into an aquarium in order to condition them but the following day the pair had spawned. He was most concerned that he would not have any food ready for the young and wondered whether he should, perhaps, forget this spawning. I replied by saying that he should let the eggs hatch in the normal manner; then, if the spawning was fertile, he could set-up his brine shrimp hatchery. The goldfish requires no food until it has used up its yolk-sac and is actively free-swimming, therefore it is not necessary to start the process of hatching brine shrimp eggs until the newly hatched young can be seen hanging from the sides of the tank. By the time that the tiny fish begin to actively seek food, the brine shrimp nauplii will be ready for use. Depending upon the water temperature, brine shrimp eggs can be hatched in 24 to 48 hours, and this allows ample time to arrange to have a supply of this food ready after the goldfish eggs have hatched. It would be wasteful to commence hatching brine shrimp eggs if the spawning was subsequently found to be infertile—and brine shrimp eggs are too expensive to waste.

Expert handling, aided by an early spawning, enhances the chances of producing high-quality young fish such as these (seen at last year's Northern Goldfish & Pondkeepers Society open show)

Incidently, an American correspondent has informed me that the price of brine shrimp eggs is set to 'rocket', and price increases could already be seen on the shelves of U.S. dealers. It seems that the excessively heavy snows and rainfall of last winter has resulted in a greatly raised level of the salt lakes and a consequent reduction in the salinity of the water. The end result is a noticeable shortage in brine shrimp and its eggs. This shortage has, he wrote, led to a rapid inflation of price and he suggested it would be a wise move if British aquarists purchased a good supply before these increases become evident over here.

Conservationists in the Worcestershire area have voiced concern that ponds are being allowed to dry up, or are being filled in, at an alarming rate. They consider that it will not be too many years before natural waters in the county will have virtually disappeared. This is, of course, happening in many other parts of England due to the development of the land to meet the needs of urban housing or to improve the efficiency of farming. Whatever the reason there always seems to be greater justification for draining or otherwise obliterating wet lands and natural ponds, than there is for retaining them. It need hardly be stated that this in turn tends to disrupt and, eventually, destroy the various forms of life which commonly inhabit and breed in such places. Frogs have found the man-made ornamental pond a suitable alternative to the natural pond; however, not all creatures can adapt so readily. Some years ago there was a campaign to clean-up and preserve village, and other, ponds. Would this not be an ideal and beneficial activity for aquarist societies; to locate any existing ponds, and then set about clearing the accumulated sediment and any other unwelcome matter; tidy the banks and, possibly, improve the plant-life in and around the pond. A little regular maintenance thereafter would preserve the charm of the pond, and could prevent it being lost completely. It may be that permission would have to be sought from various quarters, depending upon the location of the pond, but persistence and the offer of a voluntary workforce could have the desired effect. There is unlikely to be any opposition to the loss of a neglected, rubbish filled pond, but there is every possibility that there would be a great outcry against the potential loss of a beautiful well maintained pond which gave pleasure to local residents and public alike. A little concerted effort by a few willing workers could benefit a larger community, and preserve an original feature for generations to come. Surely this is an activity which aquarist societies will consider a worthwhile project?

This column would be pleased to hear of all and any projects to save and preserve our natural ponds and wetlands; a little publicity could be enough to encourage others to make the effort.

WHAT IS YOUR OPINION?

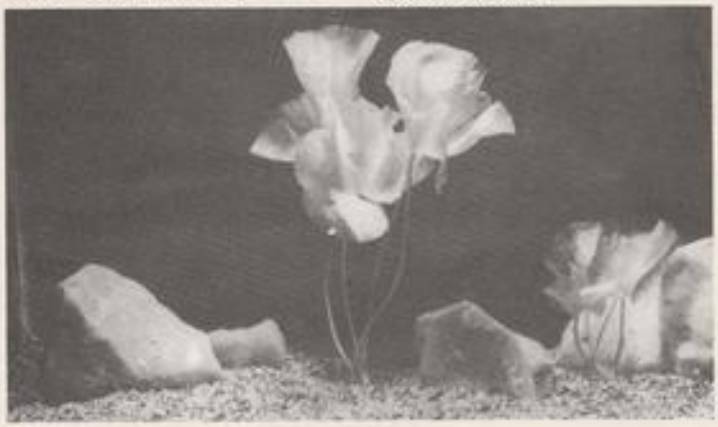
by B. Whiteside, B.A., A.C.P.

'Photographs by the Author'

SUMMER SHOULD be with us when you read this month's feature—although I'm writing it in early June during a continuing spell of sunshine and drought that began at Easter. I've managed to save my lawns and garden plants from dying because an aquarist friend and former pupil Mr. Robert Robinson plumbed in an outside water tap for me and I can now keep garden and greenhouse well watered with a sprinkler, etc. Car washing is also much easier. If, like Robert, you have one or more outdoor ponds you'll find an outside tap essential. His koi and home-bred goldfish are thriving.

Mr. D. Martin Moore, an American reader, wrote the following: "This is my third time writing to your column and I'm pleased that you found my first letters printable. I have enjoyed keeping tropicals for many years, but now I have discovered the joy of keeping native fishes. Georgia has a fairly warm climate, so I can keep these fishes with relatively few special considerations. One major feature of this aspect of the hobby is that it is considerably less expensive than buying exotic fishes at one dollar or more per fish. Native fishes are free, and it's a great deal of fun to collect them yourself. While Georgia has a large number of Cyprinids, the most interesting fishes in the region are probably the Centrarchids (sunfishes, basses). I've seen a fair number of articles on the keeping of sunfishes, but nobody seems to have any personal experience with them and I've never seen them offered for sale here (probably because they're so easy to catch for yourself). Some of the smaller members of the family are quite popular, but my personal favourite is the green sunfish (*Lepomis cyanellus*). The green sunfish has a larger mouth than most of the other *Lepomis* spp., which makes it easier to feed when it reaches an intermediate size. They will eat crickets and worms and other live foods. Anyone who keeps Cichlids would not fail to enjoy keeping these colourful animals. What's more, they are good eating if one gets tired of caring for them." (Don't think I'd like to eat my pets! B.W.)

Spatterdock plant



"On the subject of filtration, I always use undergravel filters unless the aquarium contains large fishes. Big Cichlids and so forth tend to pollute their tanks much more severely than a large number of smaller fishes. In this case, I find an outside power filter, such as the Dynaflo 150, extremely helpful. For very large tanks, one can construct a power filter with some ease, using a 10 gallon aquarium as the filter box. This not only saves money, but also allows one to build a filter bed of a satisfactory size. An oversized filter bed will require cleaning less often than a smaller one, thus giving bacteria a chance to establish themselves as an efficient biological filter. Also, heaters can be placed in the smaller tank, making for more even heating and reducing the chances of large pets breaking the heater with unfortunate results. I have heard of people using living algae as a filter medium in specially constructed devices; I would be interested in hearing from anyone who has designed or had any experience with such an accessory.

"As spatterdocks were mentioned in your column at one point, a word here might be in order. I have attempted to keep these plants on several occasions, the inevitable result being the eventual rotting of the rootstock and subsequent demise of the specimen. I often receive the plants with the rootstock exhibiting some degree of decay. I usually cut off the bad part of the plant with a sharp knife and dip the wound in a plant hormone (e.g. Rootone). This delays the rotting process, but the final result is always the same. While they last, spatterdocks are very fast growing, and make good foreground plants. It is time to get some more when the leaves begin to decay in concentric rings; the spatterdock is by then already beyond help. It is possible that a different type of hormone might be met with greater success, but I've just about given up. I recently discovered some of these plants growing naturally in my area. Those I have seen are rather large and deeply rooted in mud. The leaves and most of the petioles are emersed." (Photograph 1 shows a

Java Moss

spatterdock plant, long since dead and gone from my tank.)

Mr. D. Martin Moore, whose full address is 162 Springdale Street, Athens, GA 30605, U.S.A., concludes his letter by saying: "I am curious as to whether any of your readers are interested in fossil fishes and extinct forms. I'm considering writing an article if enough interest among hobbyists is evident."

My collection of fish fossils consists of one small, attractive specimen etched for eternity in a slice of rock. Drop Mr. Moore a line if you'd be interested in his idea. I've never tried a filter containing algae as a filter medium but I have used moss plants—Java moss, to be exact—in conjunction with ordinary synthetic filter wool. I placed a layer of Java moss over the filter wool, in an outside box filter, to catch larger particles of debris filtered off. The combination worked effectively—although, to be honest, it would probably have worked just as well using only filter wool or a handful of Java moss.

Speaking of the latter plant takes me on to a relevant letter from Mr. Robert Farrow, of 9 Wyndham Close, Birch Glen, Colchester, Essex, who writes: "After a break of nearly two years I have started to keep freshwater, tropical fish again. The break was due to my newly-born daughter, who took over my fish room as a bedroom. I have set up a tank in our spare bedroom but hope, within a few months, to get a fish house and then set up my remaining tanks—which have been kept in 'cold storage'. During the two months since I have started fishkeeping again I have realised what a resilient and persistent plant—dare I say it!—Java moss is. In June 1978 you were kind enough to send me a piece of this plant—which did extremely well in my tanks. When I dismantled my tanks in May 1982 the moss was distributed to friends. The moss had clung to two pieces of bogwood and the wood was packed away in a dry and fairly warm room in a cardboard box.

"When the bogwood was placed in my newly set up tank it was so dry that it floated. After a few days it became waterlogged and sank. Within two weeks the seemingly-dead strands of moss, which were attached to the wood, burst into life, and I now have a healthy clump of moss once again. I can only assume that the moss survived in the moisture within the bogwood; but to be out of water for some 20 months and to survive takes some doing!" (Photo 2 is of Java moss. B.W.)

"As I am making a fresh start in fishkeeping I think that this is the right time to clear up an issue which started when, in March 1980, you included in *W.Y.O.?* a letter from me dealing with a fish called *Ancistrus dolichoptera*. In August 1980 you printed a letter from a Mr. Hollyoak who seemed to imply that because he could not find this fish in his reference books, I had concocted the name and that you had abetted me in this by publishing my letter. This did not seem very important at the time and I did not pursue this with you or Mr. Hollyoak—who also wrote to me. I would like to state that I do not concoct names and I always try to be as accurate as possible.

"I spent an hour looking through my limited books and magazines and came up with the following references to *Ancistrus dolichoptera:* (1) April 1977—fish called *A. dolichoptera* wins 3rd place in class in Catfish Association open show; (2) October 1979—*The Aquarist & Pondkeeper* publishes article on the successful breeding of this fish; (3) January 1980—Catfish Association publish the same article that appeared in *The Aquarist;* and (4) Petfish Library publishes *Enjoy Your Catfish* (no date) which contains a photograph of, and mentions, *A. dolichoptera*.

"I think that *Ancistrus dolichoptera* was originally called *Xenocara dolichoptera* and that this is where the confusion has arisen. Reference books are obviously a must for all serious fishkeepers—but they need to be updated. Such information seems to be available only from specialist societies. How about a column in *The Aquarist* dealing with name changes, reclassification, etc. of fish and plants? This could be monthly, quarterly or whenever information is available. Surely this would be of great help to many people and is a fitting area for *The Aquarist* to be involved. The collection and correlation of such information should not take someone very long and the space needed in the magazine would be quite small."

I certainly think it's a good idea. Perhaps our Editor will ask one of our expert contributors to follow it up. I have a lot of reference books but the vast majority are long out of date. It concerns me if I ever have to refer to the kribensis by any other name because

I'm never too sure what it is currently. Is it still *Pelvicachromis pulcher*? Photograph 3 shows one. Have you bred any with plenty of spots on the fins and tail?

Kribensis

Mr. Ray Love wrote to me from 211 Portsmouth Road, Cobham, Surrey. "Over the 13 years or so that I have been keeping fish, my main failing, in company with many other hobbyists, is in growing healthy plants." (Photograph 4 shows one of my planted tanks. B.W.) "During this period the only times that I have managed to grow reasonable plants have been in an aquarium exposed to some degree of natural, direct sunlight. Algae were not really a problem as the sunlight was invariably in the late afternoon or evening. I have tried many combinations of fluorescent tubes and tungsten bulbs; no combination was very successful and there was little to choose between them.

"One combination I tried which was rather better than the others was one 60 watt bulb coupled with one 20 watt Northlight tube over a 36 in. tank. Unfortunately, even this one bulb caused the water to overheat in the summer—the temperature never falling below 85°F—and this killed most of the plants. On the subject of tungsten bulbs, during the year or so that I used them I did not have to replace them very frequently. Although no statistics were kept, I would estimate that the 60 watt bulbs lasted about two or three months. At 10 hours a day it seems that I achieved significantly better results than most of the bulbs you have used! I cannot remember which brand of bulbs I used, though I believe it was Osram." (40 watt Woolworth's bulbs in my latest records lasted: 98, 117, 223, 75, 137 and 176 days in aquarium hoods. One in an open bedlight lasted almost two years. B.W.)

Mr. Love continues: "Have you or any readers tried using 'The Oxydator'? At almost £30 it certainly isn't cheap, though if it does all it is claimed to do I suppose it represents fairly good value and I'm surprised more hasn't been written about it. I bought one myself about a year ago and although one can see oxygen bubbling off at times, it's difficult to say if it is performing all the functions claimed. At times—during last year's hot summer for instance—I turned off the aeration in my tank containing The Oxydator and I must admit the fish showed no evidence of distress even though the tank is tightly covered. As the device is supposed to have turned the entire tank into a 'biological filter' I suppose it would be dangerous for me to discontinue its use suddenly, so for the time being I will have to carry on using it.

"The whole thing is black in colour and about 8 in. tall and the catalysers break the H202 (hydrogen peroxide) down into water and oxygen. The H2O2 becomes more and more dilute and is replaced after about four weeks. As the ceramic container does not have to be removed when the plastic container is refilled, it is possible to bury it deep in the gravel where it stays permanently.

"Finally, isn't it nice to learn that Ken Livingstone has banned fairgrounds from offering goldfish as prizes in the G.L.C. area? One point though: as most of us begin our hobby by winning such a prize, is it possible that we will see a decline in the number of aquarists in future years?"

Must say I've never heard of or seen an Oxydator so I cannot pass any constructive comment. I think we all have a duty to encourage young aquarists in any way possible. A couple of days ago I discovered that 12-years-old Gavin Meek, a very pleasant young man in my first year class, is a keen aquarist. I made the discovery when Gavin arrived in class with a large book, about tropical fishes, from the school library. When I learned that his plants don't grow too well I took him a large bag of Indian fern plants; and next morning Gavin kindly presented me with a little plaster arch for the fish to swim through in one of my tanks—and that's something I've never had before in all my years of fishkeeping! Perhaps we could arrange a 'Meet the Aquarist' feature on Gavin in the near future. If you have any spare fishes, plants or equipment why not give some to a local youngster who's just beginning. That's the best way to encourage new aquarists.

For a future issue please send me your opinions on any of the following: (1) small catfishes; (2) caring for your fishes while you're on holiday; (3) feeding aquarium plants—if necessary; (4) breeding the smaller gouramies; (5) garden ponds in summer; (6) keeping koi; (7) getting aquarium plants to grow; and (8) *The Aquarist & Pondkeeper*. I include the magazine itself because this is its Diamond Jubilee year. It's amazing to think that *The Aquarist* is still going strong after 60 years—and that next month, September, will mark the 50th year as a contributor of my fellow-contributor Mr. Jack Hems.

Planted aquarium

I look forward to receiving a few lines from you.

Tomorrow's AQUARIST

FUN-FISH COMPETITION

THE first lucky winner in our Open Fun-Fish Competition is **Jane Wood** (age 13) for her witty drawing of an American Flagfish. Jane, who lives at **48 Garside Street, Worksop, Notts.,** will shortly be receiving the first of her **six free issues of 'Aquarist & Pondkeeper'.** Congratulations Jane!

Keep your entries coming—you could be the next winner. For full details of this Competition, see our May 1984 issue of *Tomorrow's Aquarist.*

Jane's prizewinning entry

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All material for Tomorrow's Aquarist should be addressed to:-

The Consultant Editor,
The Aquarist & Pondkeeper,
The Butts, Half Acre,
Brentford, Middx.

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THE NEW TANK SYNDROME (Part III)

PROBLEMS associated with the New Tank Syndrome usually take a few weeks to clear. This is the time it takes, on average, for things to settle down and for most new aquarists to master the basics of fishkeeping. If, however, any individual problem is of such a magnitude as to require the complete stripping down and resetting of the aquarium, then everything goes back to square one and a fresh and equally long settling down period, with all its potential dangers, will be required.

Plant stocking levels

Last month some guidelines were given about correct stocking levels of fish. It may have seemed to some readers that the figures quoted were rather low. In fact, they were not—as bitter experience over the years has taught us.

On the plant side, the tendency is towards understocking. At least, this is the trend in U.K. On the Continent, particularly in Holland, plants are, quite rightly, given as much prominence as fish and understocking is virtually unheard of.

Without doubt, living plants have a very important role to play. They not only help the maturing process along, but they are also very useful "buffers" against abrupt changes in water quality. In addition, they provide shelter for young and timid fish in an aesthetically pleasing way. Really, no tank should be without a full complement of living plants unless the species of fish being kept dictates otherwise. In such cases, artifical plants can substitute for natural ones in terms of beauty and shelter.

Temperature and water quality adjustments

Most aquarium thermostats are pre-set at a safe middle-of-the-road tropical temperature, i.e. 24-25°C (mid 70's°F). However, it is always wise to allow a period of time for checking and adjusting the setting **in the absence of fish.** This is yet another reason for resisting the temptation to introduce the fish too early.

As far as water quality is concerned, it is always a good idea to buy a Water Test Kit at the same time as you buy your first aquarium. The two most important parameters that you need to measure are pH (acidity/alkalinity) and Hardness (soft/medium/hard). These kits are inexpensive, easy to use and can prevent a great deal of distress and trouble later on.

It must be stressed that any necessary changes in temperature or water quality must be made **gradually.** Abrupt changes, even modest ones, can kill.

Some closing thoughts

However hard you try, you may still end up with teething problems. Fish may be carrying some disease even if they look healthy; netting and transportation cause stress which can lower the level of resistance that a fish may have against certain diseases; you may have unknowingly bought fish which are quite incompatible with each other; you may not have allowed sufficient time for the temperature in the polythene bag in which you carried the fish home to rise/fall to that of your tank . . . In fact, you can sometimes follow every conceivable "rule" that is thrown at you and still fail simply because there are no infallible "rules" where living organisms are concerned.

However, guidelines **are** useful. If nothing else, they give both you and your fish a good fighting chance, as millions of successful aquarists all over the world will testify.

Oscars, whether juvenile or adult, are incompatible with most community species of fish

Company Profile

Japanese Water Gardens

A corner of the attractive Japanese-style indoor pond section. Details of specimen Koi are displayed here for clients' information

The Japanese Water Gardens opened to the public during Easter of 1983. Although only halfway through its second year of operation, this centre has already admirably proved its worth by attracting fishkeepers (both coldwater and tropical) from far and wide.

This is, no doubt, due to the knowledge, experience and commonsense of those at the top of the organisation.

Bernard Channing and Ron Sharp, the Directors of the Company, are both well-known figures in the Koi world. It was, in fact, their general involvement with Koi, and (particularly) their search for a suitable Show site for their branch of the British Koi Keepers' Society in 1982, that led to the establishment of the Company.

Having looked at several possible Show sites, they approached the well-known Gregory's Roses Garden Centre. Discussions followed on the potential of a more permanent development and ended with an agreement to convert a virtually derelict piece of land and old rose hybridising greenhouse into an aquatic centre aimed primarily at the coldwater hobby, within a Japanese context.

Work on Phase 1 started early in 1983 and resulted, several 8-day/24-hour-day weeks later, in the opening of the Japanese Water Gardens for business. Appropriate advertising, coupled with ease of access (1 mile from Junction 25 off the M1) and quality of stock, soon led to a substantial and ever-increasing level of trade which has continued to accelerate at an impressive rate.

This first phase of the work included a large showpiece Koi pond dug out of solid clay, a row of fully filtered outside tanks, a full complement of filtered under-cover Koi tanks, a quarantine section and the arrival of large quantities of coldwater fish and Koi from Japan. The filters, themselves, were designed and constructed by Ron and Bernard, who now offer this personal, and rather unique, service to clients.

Owing to the seasonality of Koi and other coldwater fish (which, interestingly, include Pompons — specialists take note), it was decided to expand the business in a number of directions. Phase 2 was, therefore, implemented in autumn 1983 with the conversion of an existing wooden bungalow into a tropical and reptile house with extra space for accessories and Japanese craft items. This last feature is both highly colourful and fascinating and includes Japanese Koi-Nodori Streamers of all sizes, genuine Japanese pearls *inside* living oysters, soapstone carvings, feather pictures, silk fans, kimonos, Bonsai trees and other items far too numerous to mention.

However, to return to the livestock . . . the tropical section offers an extensive range of fish which includes all the usual species, plus large individual specimens aimed at the specialist tropical aquarist, e.g. 8-inch Oscars (*Astronotus ocellatus*). Among the 15 or so species of reptiles can be found (on a regular basis) such exotics as Tegus (*Tupinambis* sp.), Spiny Lizards (*Sceloporus* sp.) and Grey Rat Snakes (*Elaphe obsoleta spiloides*). Hermit Crabs (*Coenobita clypeatus*) and Tree Frogs (*Hyla* spp.) also figure prominently among the "non-fish" quota of species available all the year round.

On the dry goods side, there is a wide range of foods, treatments, tanks, vivaria,

Part of the outdoor sales area

filters, pumps, heaters, garden ornaments, ponds, books, magazines, Koi-nets and the Company's own brand of butyl/P.V.C. pond liners.

The final part of the Phase 2 additions consists of a plant department which will be further developed to add other species of marginal, floating and oxygenating plants to the existing selection.

Plans for Phase 3 are already well underway and will be put into operation in the near future. The main feature of this new development will involve the closure of the small road that currently separates Phases 1 and 2. This will then make it possible to landscape the area with display ponds, ornamental bridges and carefully selected plants to create an authentic outdoor Japanese garden. We wish Ron, Bernard and Martin Goddard (our enthusiastic and knowledgeable guide during the visit) continued success.

Before ending this article, though, it is well worth returning to a point mentioned briefly earlier, i.e. quarantine. Readers of this series are, no doubt, aware of the emphasis that we, at *A & P*, place on quarantine or (to use the in-word) acclimatisation.

During our visit, Ron Sharp was in the process of receiving a shipment of fish from Japan and extended an invitation to observe the debagging procedures applied to all coldwater arrivals (except Koi above 8 inches which are received and treated off-site).

A Black and Gold Tegu, *Tupinambis* sp.

The system works as follows:

1. Bagged fish are taken from the arrival boxes and floated in the receiving/holding tanks.
2. The neck of each bag is rolled back and a small amount of stale water is removed with a jug.
3. An equal amount of water from the holding tank is then added to each bag.
4. This is repeated several times over a period of 30 minutes or so.
5. Each fish is then removed gently by hand from the bags and the water disposed of.
6. The fish are then left to settle down and recover in semi-darkness.
7. Recovery is generally fairly quick (approximately 24 hours).
8. When this has been accomplished, food is offered (sparingly at first).
9. Although full recovery may appear to have occurred, all fish are kept under observation for two weeks, or longer if necessary.
10. During this period, all specimens are checked regularly and treated for general body parasites.
11. Once Ron and his staff feel certain that the fish are fit, they are transferred to the relevant tanks in the Koi/Coldwater section.

The Larger Koi are very tame and can be hand-fed

As you can see from the above, any coldwater fish bought from the Japanese Water Gardens will have been given a very thorough going over before being offered for sale. The results of this approach speak for themselves—how else could Phase 3 have been possible?

For further details, contact the Japanese Water Gardens at Gregory's Roses, 251 Toton Lane, Stapleford, Notts. NG9 7JA. Tel: (0602) 397926.

Meet the Societies

HENDON AND DISTRICT AQUATIC SOCIETY

The H. & D. A. S. Logo

Veiltail Goldfish

Angel, *P. scalare*

MANY of our leading Societies are known, not just for the efficient way in which they run their affairs, but also for that something extra which makes people sit up and take notice.

In the case of Hendon, this special something takes the form of (justifiably) widely acclaimed Annual Congresses. The policy behind these events is to invite prominent lecturers from overseas—people whose names are well-known within U.K. but who would otherwise be out of the reach of most aquarists.

The list of famous names is extensive and includes Prof. Conde, the Director of the Nancy Aquarium (Hendon and the Nancy Society are twinned), Col. Scheel from Denmark, Herbert Axelrod from America, Arend van den Nieuwenhuizen from Holland (who provides many of our exceptional Cover and Spotlight photographs) and the ever-popular (and superb!) Bill Tomey, also from Holland. Bill is, in fact, a Life Member of Hendon and will be addressing the Congress again this year, having already done so on three other occasions. For full details of the Congress, which takes place on 8 September at Aylward Lower School, Windmill Road, Edmonton, London N18, please contact Tom Glass (see below). A visit is thoroughly recommended.

H. & D.A.S. meets on the second and fourth Thursday of every month at Hendon Library, The Burroughs, Hendon, London NW4. Proceedings start at 8.00 p.m. and finish at 10.00 p.m. No formal (committee) business is discussed during these two hours since it is felt that such matters should be kept out of these more informal occasions. All members are, however, invited to attend committee meetings if they so wish.

Among the Society's other activities are trips to major Shows such as Basingstoke and the Scottish, Yorkshire and British Aquarist Festivals. The Society also awards three main trophies: the President's Trophy for work not generally recognised but essential to the running of the Society, the Troman Trophy for work done in furthering the hobby, and the Skipper Trophy for breeding fish.

Subscription Rates: Single, £6·00; Man and Wife, £8·00; Juniors and O.A.Ps,' £2·00.

Apply to: Tom Glass, 10 Adelaide House, Portobello Court, Portobello Road, London W11. Tel: 01-727 7481.

READING AND DISTRICT AQUARIST SOCIETY

The R. & D. A. S. Logo

Male Siamese fighting fish *Betta splendens*

THE Reading and District Aquarist Society was formed in 1950 by a group of 30 fishkeepers "to further the interest of its own and lay members in the study of everything that lives in or near water".

Whilst this aim is still pursued, other developments have inevitably taken place. Perhaps the most significant of these is the emergence of R. & D.A.S. as a major force in competitive Shows.

Reading was a founder member of the Three Counties Group, the others being Oxford A.S. and High Wycombe A.S. Nowadays, the group is much larger and includes Bracknell, Basingstoke, Newbury, Abingdon and Tongham A.S. The original name has, nevertheless, been retained.

These Societies take part in an annual Triela where club members compete for a trophy which is retained by the winning Society for the year. R. & D.A.S. has won this prize on the last five occasions.

Another (unusual?) Three Counties' Inter-Club activity is a darts match. As readers of this column are, no doubt, aware by now, there seems to be a strong connection between Societies and Pubs (and Pub activities)—is it a reflection of the close association between aquarists and anything that is liquid?

R. & D.A.S. holds its meetings on the first and third Thursday of each month at 8.00 p.m. at the Crown Public House, Crown Street, Reading.

Activities include a monthly Table Show, with trophies and rosettes being presented at the AGM.

Judging is done according to Association of Aquarists rules. The A of A also provides speakers from time to time. At each meeting, there is a raffle, usually of aquatic equipment or food while, twice yearly, there is a Fish Bingo (the prizes for single lines and full house being fish) and a Fish and Junk Sale. The Society also has its own library which is made available to members and runs an annual Open Show which always attracts hundreds of entries.

Subscription Rates: Joining fee (for life)—Single, £2·00; Family, £3·00; Juniors and O.A.P's, Free. There is a 50p subscription per meeting.

Apply to: Mr. Charlie Tonna (Chairman), 51A Shirley Avenue, Whitley Wood, Reading, Berks. Tel: Reading 869938.

NEWS...

SPECIAL NOTICE
With a view to increasing the number of feature articles in the Aquarist & Pondkeeper, will all Society Secretaries please note that in future we will be able only to publish details of First award winners in each class. This, of course, does not affect general reports on shows, news items or dates for the diary.

Dates for the diary

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

AUGUST

4th August: THE NORTHERN GOLDFISH & PONDKEEPERS SOCIETY, will be staging their 6th open show at the Sports Centre, Silverwell Street, Bolton, Greater Manchester. Open to the public from 1 p.m. until 5 p.m. Details and entry forms from R. Hodgkinson, 9 Stratford Close, Farnworth, Bolton, Greater Manchester. S.a.e. with application please. (Tel: 0204 75281).

5th August: LEICESTER A.S. 4th open show to be held at the St. Matthew's Community Centre, Malabar Road, Leicester. Further details and show schedules from J. Richards, 28 Huggett Close, Rushey Mead, Leicester. Tel: Leicester 666314.

5th August: BLACKPOOL & FYLDE A.S. open show at St. John Vianney School, Glastonbury Avenue, Blackpool. Enquiries to: Show Secretary, Miss V. Jones, 215 Westmorland Avenue, Blackpool. Tel: 695631.

12th August: GRIMSBY & CLEETHORPES A.S. open show at the T.A. Centre, Westward Ho, off Bargate, Grimsby, South Humberside.

19th & 19th August: YORKSHIRE AQUARIST Festival. Doncaster Racecourse. Details and schedules from Mr. N. Bolton, 11 Sherburngate Drive, Pocklington, Yorks. YO4 2ED. Tel: 07592 3177.

20th-25th August: PORTSMOUTH A.S. Exhibition of Tropical and Coldwater Fish at the St. Simons Church Rooms, Albert Road Southsea. Monday to Friday 9 a.m. till 9 p.m.; Saturday 9 a.m. till 6 p.m.

26th August: LONG EATON A.S. open show, at Gregory's Rose Gardens, Tyton, Nottingham. Any information may be obtained from the Show Secretary, Mr. G. D. Mackelvey, 51 Chesterton Road, Spondon, Derby; tel: Derby (0332) 671995.

26th August: SOUTH EASTERN SECTION of the **BRITISH KOI KEEPERS SOCIETY** open show to be held at Pollhill Garden Centre (on the A21) near Orpington, Kent (South of Bromley, Kent). Benching 9.00 a.m. to 12.00 p.m. Open to visitors from 12.30 p.m. No charge for kois—people 50p each. Entry forms and further information from Chris Ball, 65 Darnley Road, London SE8.

27th August: Bank Holiday Monday. **YORKSHIRE KOI FESTIVAL** at "Harewood House," near Leeds. For trade stand information and Koi entry forms contact: S. E. Bent, 58 Broom Crescent, Rotherham, S. Yorks. Tel: Rotherham 72671.

From Aquarists' Societies

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.

8th September: 24th HENDON ANNUAL CONVENTION. Lecturer: W. A. Tomey of Holland. Details from T. Glass. Tel: 01-727 7481.

8th September: BRISTOL TROPICAL FISH CLUB open show will be held at the All Saints' 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 Badminton Road, Coalpit 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, Canterbury.

9th September: NORTHUMBRIA COLDWATER 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 finalised you will be informed.

9th September: TONGHAM A.S. open show at "Bull Civilian" Restaurant, Buller Barracks, off Alison Road, Aldershot, Hants. Start benching 9 a.m.

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 525199.

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. Bidlestein, 33 Somerset Road, Salisbury, Wilts. Tel 0722 26219.

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

15th September: BRISTOL A.S. Coldwater Fish show at St. Ambrose Church Hall, Stretford Road, Whitehall, Bristol, from 3-5.30 p.m. Details and schedules from Show Secretary, V. Capaldi, 7A Walsingham Road, Bristol BS6 5BT. Tel: 0272-426523.

15th September: HOUNSLOW & DISTRICT A.S. open show at the Hounslow Youth Centre, Kingsley Road, Hounslow and details from Mr. T. Bolingbroke, 2 Holmewood Close, Addlestone, Surrey. Tel: Weybridge 54976.

16th September: NORTH STAFFS & DISTRICT A.S. open show at Thistley Hough High School, Penkull, Stoke-on-Trent. Schedules and further information from Mrs. E. Hackney, 146 Congleton Road, North, Sobriar Green, Stoke-on-Trent.

16th September: DORCHESTER TROPICAL FISH SOCIETY. Change of Show date. 4th open show will still be held at the Boys' Brigade Hall, Sawmills Lane, Weymouth Avenue, Dorchester, Dorset. Schedules available from Mr. B. Symes, 3 Arnhem Green, Poundbury, Dorchester, Dorset DT1 2PS, or phone Dorchester 67557.

16th September: ST. EDMUNDSBURY & DISTRICT A.S. second open show at Northgate Community Centre, Bury St. Edmunds. Schedules available from Mr. S. Forrest, 70 Northumberland Avenue, Bury St. Edmunds (s.a.e. please). Fish auction, canteen facilities, annual trophies, other attractions are planned.

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.

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

16th September: TONBRIDGE AND DISTRICT A.S. are holding their open show at Tunbridge Wells Technical High School, Tunbridge Wells.

16th 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 Les Bowman, 50 Maple Avenue, Little Sutton, South Wirral L66 3QT; telephone: 051-339 8024.

22rd September: BASINGSTOKE AND DISTRICT A.S. will be holding their annual open show at the Basingstoke Carnival Hall. Further details can be obtained by sending a large stamped addressed envelope to the Show Manager, C. F. Ralph, 325 Abbey Road, Popley 4, Basingstoke, Hants. RG24 9BH.

22rd September: WOLVERHAMPTON A.S. open show, at Pendeford High School, Marsh Lane, Pendhouses, Wolverhampton. Show Secretary, Barry Jayes, 23 Hopworth Close, Perton, Wolverhampton. Tel: Wolverhampton 750144.

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

23rd September: WALTHAMSTOW & DISTRICT A.S. open show at Queen Mary College, 99-110 High Road, South Woodford, E.18. Details from: Mrs. M. Waller, 32 Hamilton Road, Heath Park, Romford RM2 5SD.

23rd September: CENTRAL MIDLANDS CICHLID GROUP auction of fish and aquatic accessories at the Peace Memorial Hall, Penkridge, Staffs. Auction commences at 1 p.m. Further details from Maureen Hall, 71 Saxon Road, Penkridge, Staffs. Tel: (078 571) 3944.

30th 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 Craigroyston Community Centre, Edinburgh.

OCTOBER

7th October: HALIFAX A.S. open show at Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Schedules on request. S.a.e. please to David Shields, "Cobblestones," Gainsel, King Cross, Halifax HX2 7DT, or ring for details Halifax 60116.

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

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. Cresswell, Chorley 69312.

20th October: ILFORD & DISTRICT AQUARIST & PONDKEEPERS SOCIETY Golden Jubilee 1984 Annual Exhibition of Fish at the Ilford Town Hall, Ilford, Essex. Doors open 11 a.m. (approx.)

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.