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# AQUARIST

AND PONDKEEPER

*The Magazine for Fishkeepers*



*Illustrated colour feature*

**Breeding Anemone fishes**

**A Colourful South American Cichlid**



# THE AQUARIST AND PONDKEEPER

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(See article in our March issue)

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The Editor accepts no responsibility for views expressed by contributors.

# A Colourful South American Cichlid

*Aequidens latifrons*

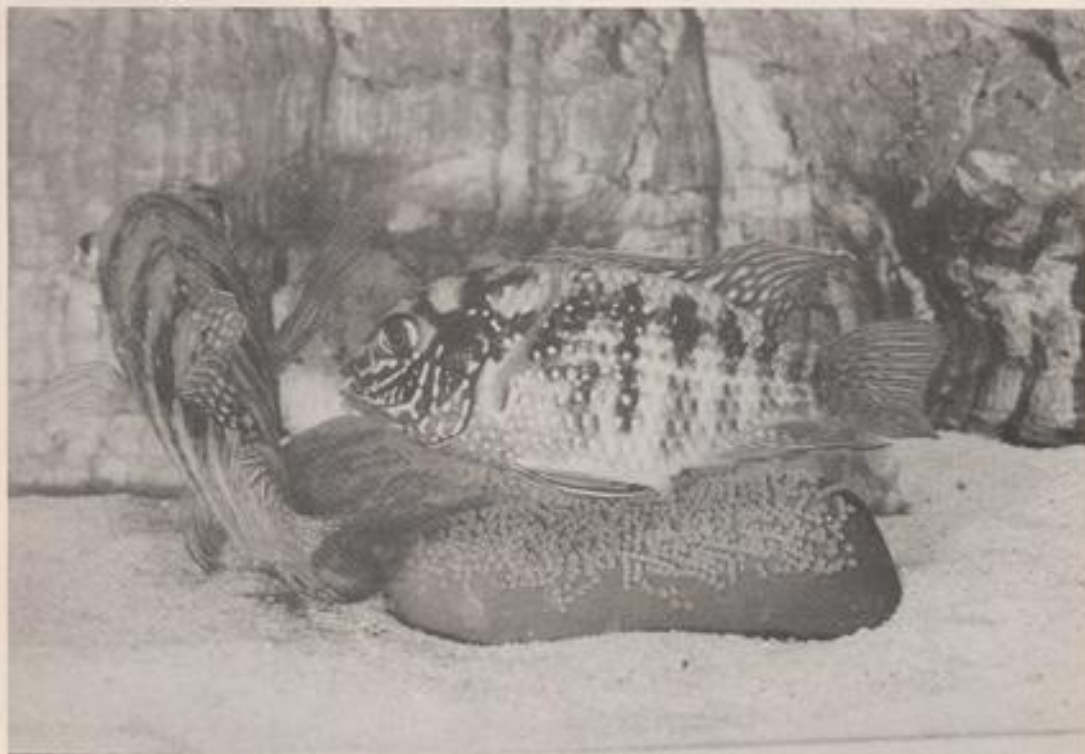
by Rudolph Zukal

AQUARISTS HAVE BECOME familiar with a fish from Colombia and Panama which is highly popular because of the marked care and attention which it devotes to its young. This cichlid has previously been known under different names—*Acara coerulespunctata*, *Acara pulchra* and *Aequidens pulcher*.

Reference works give its size as more than 15 cm, but this refers to fish in the natural state and in captivity they rarely exceed 10-12 cm. The coloration of these fish is truly splendid, for every scale is decorated with a brilliant dot. The sides of the head bear shiny, metallic blue dots and markings. The eye is large, with the iris golden yellow and having a striking red ring. The lips are thick and light blue. During spawning periods the fish are in resplendent full colour.

The larger male has elongated dorsal and anal fins which end in a point. During spawning the female is less brightly coloured than the male, the vertical stripes on the sides of her body turn black. She is fuller in the abdomen, more compressed and smaller. This cichlid can be recommended to anyone new to fishkeeping and the experienced aquarist too will derive pleasure from keeping it. They can be kept along with other species of largish fish. They need a largish tank with coarse

A few hundred eggs are laid





Female with shoal of her young

sand and some flat stones. Normal drinking water which has been left to stand is suitable, at a temperature of 20°C or more. If the fish are fed a healthy and varied diet plants are scarcely noticed, except at spawning times. However, the tank should be planted with species which take a firm hold. The fish do not dig up the bottom of the tank as is the case with many cichlids, except when they are preparing sand pits for their young. They are voracious and so produce quite a lot of waste material. The aquarium should not only be filtered, but a regular change of a proportion of the water also carried out. In old water the fish are susceptible to numerous diseases. Their diet should be varied, plentiful and, if possible, live.

Breeding the fish does not pose any problems. They spawn 8-10 times a year. They spawn readily at a temperature of 24-26°C in a medium-sized tank, often in the community tank. The eggs are placed on a firm substrate which has first been cleaned by the fish. I have often observed them during spawning and always marvelled at the precision with which the female lays the eggs.

A pair which has chosen itself produces the best results. The fish retire into a corner of the tank and drive away any other fish. In the case of the female an ovipositor is put out. The chosen spawning site is carefully cleaned by the female, who does this with her mouth. Plants in the vicinity of the spawning site are pulled up and removed. While this work is being carried out the male

merely watches with curiosity. The cleaning operation is frequently halted by the female and she glides over the stone (or whatever other object has been chosen) to see whether the site is quite ready. Finally, the first rows of eggs are deposited. Slowly the picture changes. The rows of eggs take on a star-shaped form. The male fertilises the eggs after the female has made room for him, or they spawn together. While the female lays the eggs, the male fertilises them on the other side of the site and so they swim slowly in circles round each other. Gradually almost the whole of the uncovered area of the stone is filled up, but the female has a very sensitive touch when using her ovipositor, for I have never managed to catch one laying one egg on top of another. Several hundred eggs are deposited. Both parents look after the young, which hatch after 60-70 hours. The adult fish can be left with their young until their next spawning.

# BEGINNING WITH TROPICALS

## Part 14 by Roy Pinks

THIS ARTICLE CONTINUES an analysis of some further species of smallish tropicals suitable for the beginner which I have not recently tried out, for one reason or another, though the main cause would be supply eccentricities.

Most of the species I have discussed so far have been dwellers of the middle waters, but to make the most of your tank it is a good idea to include a few fish which principally inhabit the surface or the bottom regions. This mainly achieves a greater range of visual interest, but in both cases there is an additional bonus in that the fish will usually act as removers of excess food. Those which live near the surface will often mop up floating excesses, and the bottom dwellers spend much of their time poking into all the nooks and crannies in search of interesting tidbits which have sunk to the floor of the tank after feeding sessions.

### Hatchetfish

The Hatcherfish comprise an interesting group of surface dwellers, and there are two commonly available species—*Carnegiella strigata* (the Marbled Hatcher) and *Gasteropelecus levis* (the Silver Hatcher). The former, never exceeding the 1½ in. mark, is silver with dark brown markings, and the Silver Hatcher is self coloured apart from a dark longitudinal line, and grows to well over 2 in., somehow markedly larger and heavier. These fish, which progress through the water with some awkwardness but great rapidity often take off from the surface, so the tank must be well covered if tragedies are to be avoided. Although dried food will most certainly be taken, they really prefer live food, and this should be quite small and floated on the surface. Tiny flies are relished, and any small *daphnia* operating in the top inch or so of the water will be disposed of rapidly. During the summer months greenfly, which have not been exposed to insecticide sprays, are ideal and, of course, all other surface-hunting fish will

compete for them most vigorously. For the rest of the year, finely clopped whiteworm will be of interest, though, the most profitable food of all will be the fruit-fly. Though this is not the easiest thing to culture, every beginner should have a shot at the technique some time or another if fairly high room temperatures can be maintained. If not, forget it, and concentrate on the foods mentioned above. These species are not steadily available, and atrocious specimens are often offered for sale, so always go for the plumpest fish you can obtain. Of the two species I have always found that the Silvers are the least long lived though in truth neither can be regarded as long term investments. However, I have never been able to maintain a steady supply of flies, and I suspect that this has been my undoing. I have heard from dedicated fanciers from time to time who have kept these species for several years—certainly, they are attractive and interesting enough to justify the extra effort to provide an optimum diet. Otherwise, from the point of view of water quality and disease proneness, they have never given me any trouble.



**Black Widow**

Remaining on the subject of fish slightly different from those of conventional shape, I would certainly commend the Black Widow (*Gymnocorymbus ternetzi*) as a most desirable and attractive species. Its main shape always reminds me of a stubby Angelfish, and as its silver and black colouring further bear this out, it is the obvious answer to those whose attraction to this cichlid tempts them to make the terrible mistake of including it in a mixed collection of smaller fish. By contrast, the Black Widow is quite peaceful and rarely exceeds 2 in. in length, so its proportions in the average tank are quite acceptable. The colours, as viewed in the dealer's tank, are often rather washed out, and in these conditions they do not

look their best. In a settled state, and especially in anticipation of breeding, the black markings become extremely dense, and they contrast strikingly with the basic silver. The wild type is to be greatly preferred to the horrible malformations which have been developed by certain so-called breeders, and it is sad to see the overall loss of ruggedness which has been sacrificed at the altar of long finnage. Such creatures are the bane of many fish which are normally peaceful, but which exhibit good taste by hounding to death the freaks which are so regularly and misguidedly offered for sale to the gullible. Otherwise this species is as tough as they come, offering no maintenance problems whatever. It occupies the middle water and is showy until it ages, when it tends to remain motionless alongside a favourite plant or feature. Even so, it still provides dignity to your collection.

#### **Black Wedge Tetra**

*Hemigrammus pulcher*, or the Black Wedge Tetra, is an attractively plump little fish, rarely much above 1½ in., which advertises itself by the conspicuous triangular black triangle situated in the rear third of its body. This is a species which really glistens when in good condition, the red eye making an interesting contrast to the black wedge. It should be kept in a small shoal for best effect, and there is little doubt that it prospers on a range of live foods. I have found that it accepts most foods willingly enough but the survival rate rises steeply with a more interesting diet. It is completely peaceful, perhaps a trifle less exuberant than some of the other small tetras, but as colourful in old age as when young. In fact, some old fish are positively glowing and they are well worth cultivating. They have proved, with me, to be fairly resistant to most of the external disorders, but I have often lost them through dropsy and internal maladies. Not available often enough, buy them when you can!



## Coldwater Jottings by Frank W. Orme

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THE EDITORIAL which appeared in the November issue of this magazine concerned the problem of cats; most cold-water fish keepers who have ponds have suffered the unwelcome attention of the feline menace. In the penultimate paragraph of the editor's article he wrote: '... there are those who, while professing great affection for their feline familiars, turn them out of the house at night for what good reason one cannot conceive for it smacks of complete disregard for the animals involved and for the sanctity of neighbours' property.' This voiced my own sentiments, therefore I was surprised to read, shortly afterwards, an article in a local newspaper reporting a spate of cat deaths. It appeared that a number of cats had died from suspected poisoning and "frightened" cat owners in the area were keeping their pets indoors for safety. A spokeswoman of the District Cat Protection League said: "The tormentor doubtless has a grudge against cats." Now, whilst I do not countenance the illegal act of poisoning animals, which can result in a slow and painfully cruel death, I do wonder just who is the 'tormentor';

is it the person who has taken such drastic action or is it, as seems more likely, the cat which has plagued its killer beyond endurance?

Over the past twelve months there seems to have been a great increase in the cat population in the immediate area near my home, as a procession of different cats beat a track across my garden. Of these, one or two were obviously very interested in the pond and its inhabitants and this, together with some of their other annoying habits, would prompt my wife to throw a stone in their direction and voice her opinion of these animals to me. Fortunately, my ponds are protected by netting which prevented the jabbing paws of the cats harming the fishes.

Not so long ago, due to reported robberies in the vicinity, I decided to obtain a young Alsatian. Since the acquisition of this protector it has been most noticeable that the cats no longer visit our garden—or at least not whilst they risk meeting the dog. Equally, of course, there is less likelihood of the two legged, human marauder taking fish if their presence is likely to be given away by a barking dog. The dog helps keep at bay both of the pests. It is only during the last few years that my garden has suffered the attention of the cat; previously there had always been a dog around the place and to see a cat in the garden was a rare sight. So, perhaps the answer to the feline problem is to have a dog which dislikes cats, and will not permit their trespass upon its domain.

### Looking forward to spring

Soon the hours of daylight will begin to lengthen, young green buds appear on our trees and all those other many longed for signals that herald the approach of another spring will become evident to even the least discerning eye. Slowly rising temperatures will begin to entice our fishes into increasing activity and this will encourage a gradual increase in their appetite as they also respond to the call of the coming spring.

Coldwater fishkeepers are not immune to this spring-time phenomenon, which results in frequent visits to the pondside where the returning activity is eagerly noted, for surely this annual revival of interest is one of the great joys of the enthusiast.

All too often some newcomers to the hobby, in their eagerness to encourage the fish to become more active, make the mistake of offering too much food. This over-feeding will neither accelerate the return of the fish from a semi-dormant state nor assist the fish to reach that degree of health that will bring them into breeding condition. In Nature, with the approach of cold weather, supplies of food are gradually reduced until it becomes very difficult to find in any quantity and the semi-dormant fish are forced to live off their accumulated reserves of body fat. With the advent of spring the trend is reversed. Slowly different forms of food become available in gradually increasing quantities. Spawning usually occurs when food is in full flush and the minute life, required by the newly hatching fish fry, abounds in plenty.

*Continued on page 26*



by  
Roy Pinks

## Those leaky Ponds again

AFTER MY marathon repair session on the Plastolene pools two years ago I laid myself open to all sorts of critics, sceptical that such crude but cheap methods could possibly succeed. At the same time I have gradually acquired a creeping horror that one day I would have to confess to readers that all the pools had emptied themselves overnight. One moment of truth came during that very warm and dry spell in August, when the Nursery pool dropped six inches in 24 hours. And the other came when I realized that the level of the main pond was not what it ought to be, even allowing for the prevailing abnormally high evaporation rate. Toppings up revealed that the leak in the small pond was rapid, but the one in the other case was a "slow" which yielded a fall of about four inches over ten days or so.

Over several weeks I indulged in silent mental debate, mainly to conceal from the family the true order of cost of replacement material, but equally I was somewhat sensitive about the apparent undignified end to what had been a pretty taxing project. The problem is not simply one of letting the water fall to its lowest point and then looking for the hole, but of considering what manner of mischief may be going on down below. All in all, the leaky pond is a demoralizing complaint, like an ulcer, and as tricky to locate and cure, but it has at least the merit that it joins together the afflicted in debate and good sometimes emerges.

### Preparing for winter

As September rolled towards its end I did my seasonal trick of ignoring the garden for a week or two and concentrating on preparing the outbuildings for the onslaughts of winter. This involves much clambering around felt-clad roofs, looking for potential leaks, and generally patching up. The added bonus of the hot weather was that the various sorts of goo with which one repairs holes spreads easily and runs into all the right places, and progress was excellent. I normally use roofing felt Lap Cement for this sort of job, but I happened to run out of it and was unable to get any at the local giant supermarket, noted for its ability to supply almost anything you do not actually want. However, on this occasion I struck what may yet turn out to be oil. One shelf displayed a number of tins of a black buttery mastic by Cuprinol named *No More Damp*, and as it bore the not unreasonable price of £1.75, I saw this as a good candidate for filling in some of the more awkward rucks in the felting which my inspections had brought to light. On the following day, wallowing in the sun on the top of the garage roof, I marvelled at the ease with which the stuff went on, and it was pretty economical too, all surplus proving to be easily removable with the old kitchen knife used to apply it. In the course of all this came the great thought this may prove to be a means of repairing the pond leaks, too.

I was not particularly optimistic about it, I must admit, and suspected that the surface of this material would never dry sufficiently to make it safe in the pool, as browsing fish would undoubtedly peck at it, with likely



fatal results. Nevertheless, I located some slits in the sheeting where I had experimentally joined two pieces, and simply spread on the mastic, fairly thickly. I reasoned that I could always scrape it off after 24 hours or so if it had failed to harden. One look at the garage roof the following morning rapidly raised my hopes: it had been a cool and dewy night and the felt and mastic were soaking, but the latter had hardened very considerably, to the extent that nothing came off on one's hand under rather more than gentle pressure. Examination of the sheeting in the pool gave much the same sort of reading, and this was tremendously encouraging. I was not worried about possible toxicity—such bitumastic elements are in very common use and are generally inert once dry.

Well, I filled the pool after about 48 hours of drying, and I am glad to note that the level has remained at the high water mark now for long enough to prove that the leak was stemmed. It will remain to be seen how long this will hold out—the winter is always a severe testing time for trials like this. I hope that before winter sets in I shall have an opportunity to apply similar treatments to the big pond, but as this is rather overgrown and there is a lot of algae growing around the waterline, it will be a very difficult job to locate the holes. But there is a very big incentive in putting this to rights in view of the soaring costs of total replacement of the sheeting material.

#### **Bitterling—way in, no entry**

It is clear that recent discussion about bitterling has put a lot of cold water enthusiasts on their mettle, and I have received a letter from Mr. M. S. Wright of Barking to the effect that his fish performed almost exactly as Laurence Perkins described some years ago. The point of this was that the eggs were apparently deposited in the discharge valve of the mussel, whereas it is usually assumed that they are laid in the intake and expelled through the other one.

It has since occurred to me that perhaps this is a completely wrong assumption. We all tend to think that what goes into an entry must come out of the exit—this is akin to "What goes up must come down", and it is not always valid. Supposing that, in the case of the bitterling, what goes into the intake is simply processed, with the refuse expelled via the outlet valve, it is not unreasonable to suppose that any eggs so laid would come to nothing. But if nature intended some tacit understanding between the mussel and the fish that if eggs were deposited in the outlet cavity in a certain way, they would be allowed to remain until the fry were able to fend for themselves, this would make a lot of sense. It may in fact prove that this is the truth of the whole matter, as Mr. Perkins did point out that the transaction was very fleeting indeed, and might be missed by a casual observer. Whatever the facts may be, I fancy we shall all keep watching events very closely. My own fish are very undecided. There are several mussels available and the female has an ovipositor some 3 inches long, but spawning has yet to take place. There are indications that temperatures well into the 60s are necessary, and I shall be taking this very much into account.

#### **Coldwater Jottings—Continued from page 24**

Obviously, the ideal is to copy Nature as near as possible. When the fish are seen to be truly active, offer them just a small amount of food. Commence by trying a little food every other day. As the temperatures rise, slowly increase the amount whilst reducing the interval between feeds. Where possible, provide live food. There is less likelihood of this type of food causing pollution in the event that it is not all eaten.

Try not to feed more than can be eaten in a few minutes; if any is left withdraw further feeding until the previously given live-food has been consumed by the fish. It is even more important to observe this rule when feeding with non-live foods. More problems arise from overfeeding than from underfeeding! If the intention is to spawn the fish there is no finer food than the earthworm as a conditioning food. Cleaned, and chopped into suitable sizes, the earthworm can become the major item in the diet and this, coupled with increasing temperature and hours of daylight, should bring the breeders into that state of health and well-being that will result in a spawning.

#### **Supplier/customer relations**

Manufacturers must rely upon the satisfaction of their customers if they are to continue to sell their products, and good customer relations are essential. Yet, all too often, one hears of companies who show a complete disregard for this vital aspect of their dealings with the public—perhaps they do not believe that it is much easier to get a bad reputation than it is to preserve a good one. Unheeded complaints will do nothing to create that necessary confidence which a customer must have, if repeat sales are hoped for. Fortunately not all manufacturers are so short-sighted, and make every effort to preserve their good name. I am pleased to say that one such company is that of Armitages Pet Products of Nottingham.

Earlier in the year I had purchased one of their products which, some months later, developed a fault. Although, over the years, I have often purchased equipment manufactured by this company, this was the first occasion that I had found cause for complaint. The faulty item was, therefore, returned together with a letter explaining why I had returned it. Much to my pleasure I received a letter by return of post, signed by Miss W. S. Handford. It contained a paragraph which read: "We are anxious for all our products to give satisfaction and would not knowingly offer for sale any that would be likely to undermine the confidence of our Customers." The letter finished by promising a suitable replacement and an apology for any inconvenience which might have been caused. Within a few days the replacement was delivered and, at the time of writing, is performing in a satisfactory manner. Needless to say, such quick action restored my confidence in the company and its products.

At the foot of the letter was the slogan 'The Firm that cares for your pets.' It is very obvious that Armitage Brothers also care for their public relations image for which I, for one, thank them.

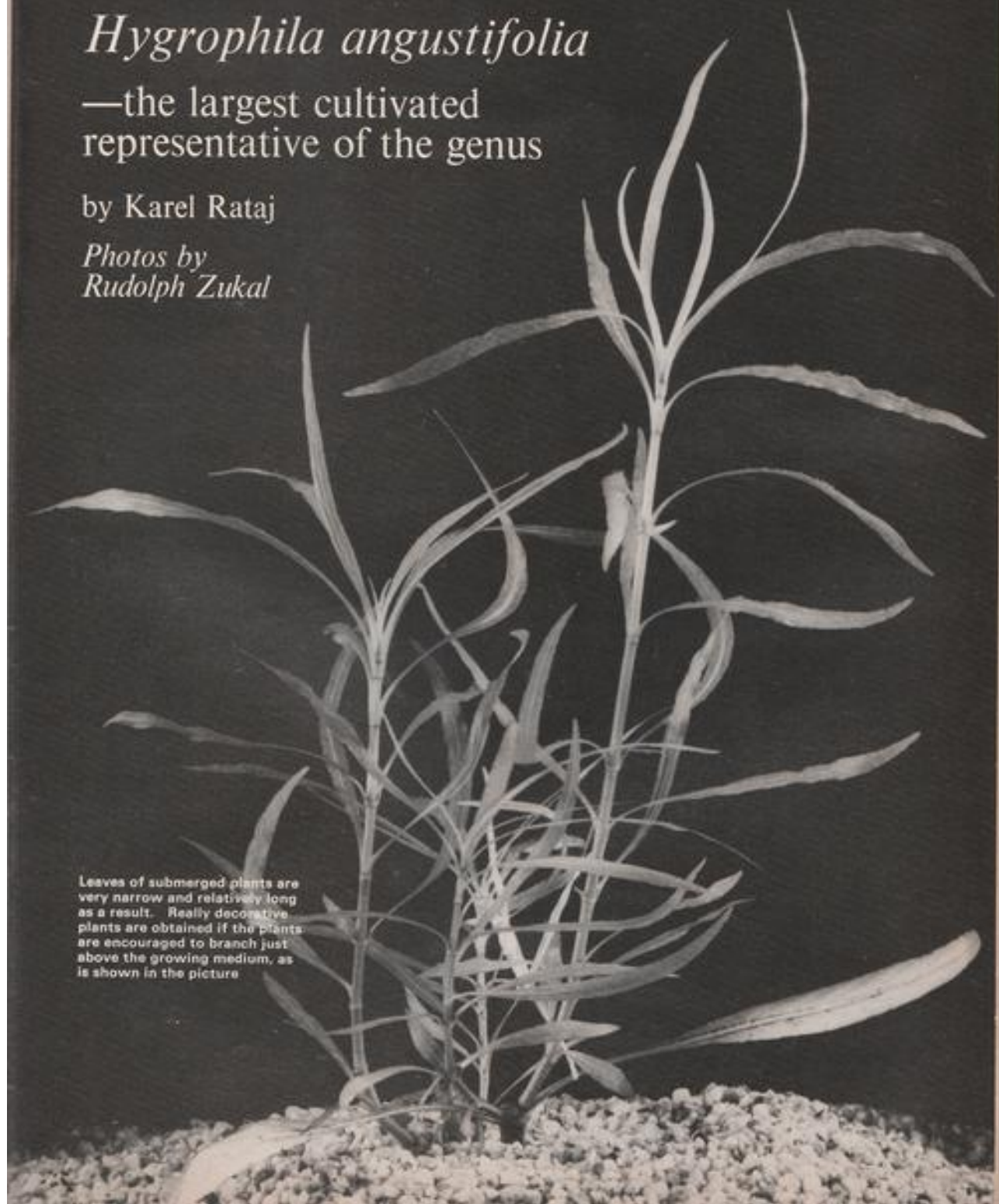
# *Hygrophila angustifolia*

—the largest cultivated  
representative of the genus

by Karel Rataj

*Photos by  
Rudolph Zukal*

Leaves of submerged plants are very narrow and relatively long as a result. Really decorative plants are obtained if the plants are encouraged to branch just above the growing medium, as is shown in the picture



*Hygrophila angustifolia*, also known under the synonym *H. salicifolia* Nees, belongs to the family Acanthaceae. The family includes plants with entire or slightly serrated leaves. The flowers grow from the leaf axils either individually or in clusters, are rather small and have a two-lobed corona. They are usually white shading into bright blue. The emerged plants of most species are slightly to heavily covered with hairs, the submerged ones are bald. All species of the genus *Hygrophila* are amphibious, but only certain ones adapt easily to a submerged existence.

*Hygrophila angustifolia* is the largest of the cultivated species. In its emerse form it may reach a height of up to 150 cm and in such cases develops into richly branched plants with sturdy stems, which are markedly thickened at the points along them where the stipules are. As a result they are reminiscent of bamboo. They may be up to 1.5 to 2 cm thick. Their leaves are opposite and decussate, that is to say that alternate pairs of leaves are set at an angle to each other. The leaves of emergent plants are green, smooth, when well developed 12-15 cm long and 1-1.5 cm broad and on the undersides clearly lighter (almost whitish) than on the upper surface of the leaf. They grow almost directly from the stems or are set on very short leaf stalks. In summer *H. angustifolia* flowers regularly. The flowers form in clusters in the leaf axils with developed axillary buds, so that next to the flowers one or two pairs of young leaves are to be found. From these, lateral branching develops later. The upper border of the flowers is unbroken, the lower part of the crown is deeply indented and each of the segments has small indentations in its turn. The flowers are slightly bluish at first, later white; sometimes white from when they first develop. After a few days they wilt and take on a yellowish-brown coloration. Each flower has four stamens, which is true of all the species of the genus, with the exception of *Hygrophila polysperma*, which has only two well developed anthers, whereas the other pair of stamens is stunted, consisting of so-called staminodes. The whole plant, even in its emergent form, is without hairs, both on its stems and leaves. In this way it differs from many similar species of which mention will be made later.

As an emergent plant *H. angustifolia* grows extremely quickly and the additional growth of the plant put on in a day may be as much as 2-3 cm. One can, therefore, obtain a large number of cuttings from emergent plants (see photo) and these are suitable for adaption to cultivation under water. For this purpose, in fact, only the vegetative tips are used. The remainder of the plant which has been pruned very quickly sends out shoots from the uppermost pair of remaining leaves which develop into lateral branches. When they attain a length of 10-15 cm, the additional internode is cut off and placed under water. The middle parts of the leaf-covered stems without vegetative tips take root with difficulty under water.

Although *H. angustifolia* is a popular and easily cultivated aquarium plant, experiences with it differ. It has certain demands with regard to its environment and the process of adapting emergent plants to a permanently submerged existence does not always take place successfully. Sometimes



Bluish or whitish flowers grow from the leaf axils

the 10-20 cm long shoots lose their lower leaves and as a result only the top two or three pairs of leaves remain. Such plants take root slowly or not at all and usually the leaf-bearing tips must be nipped off again and planted anew. A complete adaptation from the emergent to the submerged form takes up, in contrast to other species of the genus, a relatively long time (2-3 months). When it is successful, *H. angustifolia* is amongst the most attractive of plants. In its submerged form it has a very different appearance. In contrast to emergent plants, submerged plants have much narrower leaves, are dark green and on average 7-8 cm long and only 0.5 to 0.9 cm wide. Submerged plants become much sturdier of their own accord and put out a profusion of new branches if they are helped along by having their tips nipped off. This should never be carried out, however, until one is sure that *H. angustifolia* has taken root properly and that the transition to the submerged form has been fully completed.

For decorating the aquarium, therefore, plants which have been grown under water are the most suitable. In its submerged form, however, *H. angustifolia* grows much more slowly than above water and so highly productive growth is only possible (as is needed in nurseries) with emergent plants. One rule should be observed here and that is the following. Plants from nurseries should not be delivered to specialist retailers until they have spent 2-3 months adapting to a submerged existence.

While adapting from its emergent to its submerged form *H. angustifolia* needs sufficient light, neutral water or water which is slightly alkaline, but it must be clean, and soft to medium hard. Plants which have fully adapted to a submerged existence are not subject to loss of foliage and are even able to withstand quite acid water and half shadow. They can, therefore, be grown in aquaria of both the Indomalaysian and South American biotopes. Under water it attains a length of 30-40 cm. It is suited, therefore, to high, spacious tanks for planting in the corners or background. In smaller tanks the plants often grow out of the water and back into the emergent form. Under good growth conditions this may also occur in deeper tanks, as their stems are upright and sturdy. In such cases they must be pruned back. Normally the stems are nipped off just below the lowest pair of lateral branches. In order to form an area of fresh green, attractive vegetation, two or three plants are sufficient, along the tank sides.

*Hygrophila angustifolia* comes from tropical Asia and extends there from Eastern Asia to Indonesia, Australia and New Zealand. It is typical of the vegetation of rice fields and the bankside vegetation of larger waters, where it grows on watersides which are subject to occasional flooding and receive plenty of daylight. It is also common along irrigation and drainage channels and in marshland.

#### **NAPFEX '82 POSTPONED**

Broadway Exhibitions Ltd., organizers of the proposed National Aquarium Pondkeeping and Fishbreeders Exhibition have recently informed us that due to circumstances over which they had no control it has been decided to postpone the event which was due to take place at Bingley Hall, Birmingham in May of this year.

The project has not been abandoned however and we understand that future plans will be announced in due course.

#### **IN OUR NEXT ISSUE**

David Sands takes us on a **CAT-FISH** collecting trip to Brazil. An attractive colour feature.

The Powder Blue **SURGEON FISH** is highlighted by Martyn Haywood in our regular **SPOTLIGHT** feature.

Rudolph Zakal reminds us of a well known but rarely kept **CHARACIN**.

*Plus all our usual popular features.*

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by  
Eric Hardy

THOUGH MOST READERS prefer to keep live specimens than a dead collection there may be occasions to visit a museum in order to identify what cannot be traced in books. The world's largest collection of fishes, 1,705,000, is in the U.S. National Museum in Washington while the largest collection of reptiles, and amphibians, 150,000, is in the American Museum of Natural History in New York. Paris has the largest collection of insects, between 50 and 60 million.

The Nature Conservancy's new national nature-reserve at Borth Bog (Cors Fochno) in the Dovey estuary of Wales is one of Britain's best dragonfly haunts, with 20 species, as well as of the rare rosy marsh-moth and the rare large heath-butterfly, and Britain's only wintering flock of Greenland white fronted geese. Bog-plants range from 3 sundews, including great sundew, *Drosera anglica*, rare in Wales, wild rosemary, bog-bean, bog-asphodel, marsh-orchids and mosses and much bog-myrtle. Covering 624 acres, access is by application to the Conservancy's Aberystwyth office. Though peat-cutting reduced it to about a third its original area, it is still the most extensive lowland raised peat-bog in Britain. The Water Authority has restored the high water-level to parts affected by former drainage-ditches.

Recent research has shown that New World coral-snakes are not evolved from the related Old World elapids and sea-snakes, as has long been considered, but are much more closely linked with South American colubrids. While

plant-plankton increases in a cleaner River Thames at Teddington, the Government's Institute of Terrestrial Ecology has been studying the predation by young perch at Loch Leven (Kinross) on the minute crustacean plankton, Cyclops, Daphnia and Diaptomus, almost their entire diet in their first summer and winter to early spring. Their preference between the 3 sorts is seasonal, *Daphnia hyalina* dominating in December, *Cyclops strenuus* in November and *Diaptomus gracilis* in September. Changing numbers of these crustacean plankton and of water-chemistry affect long term changes in the plant-plankton there.

#### D.D.T. and frogs

One of the effects of D.D.T. pollution on frog-tadpoles is being much more active and the development of a large hole in the snout, then loss of the snout, sometimes regrowing a blunt snout. Osborn has now shown how this is caused by the lower mandible striking repeatedly against the upper with a rasping action. Froglets developed from these have a bent brain, from a kink in the cranium and die earlier. D.D.T. also causes a proliferation of cells on the tadpole-skin, developing a tumour, though it is too early to link it as a possible cancer.

Not all mosses grow easily on mist-benches, from stem-fragments or leaves. The Institute has developed a new technique for the long term pure cultures of up to 2 years of more difficult mosses by using spores from unopened moss-capsules, first killing their external microbes in 10% sodium hyperchlorite for 10 mins, then immersing in sterile distilled water to obtain the spores, then dropping the suspended spores on to half-strength Knop's nutrient agar-solution using a sterile hypodermic syringe, sealed against contamination with "cling film" before keeping in an environmental cabinet at 15 deg C with fluorescent "growlux" tubes. This spore-culture may be a future method of conserving rare species.

Another area of their activity is the Norfolk broads, where much of the famous reed-swamp margins forming 82% of some broadlands has died back in recent years from coypu-grazing tasty buds and young shoots and to some degree sedimentation increasing after algal bloom or eutrophication. This in turn makes them more accessible for grazing by coypu, wild duck and feral geese liberated there on the River Bure and Ant broads. From 1946 to 1977 reed-swamp in their study area decreased by more than half, irrespective of being close or open boating broads.

#### Earthworms

What do you do with earthworms on your lawn? Brush their casts in, use them for potting-soil, or as a fish-feed? The dry matter from earthworms contains 60-70 per cent protein, with essential amino-acids, minerals and vitamins for fish-food. Fish-breeding trials produced better growth from this than on commercial diets. Researchers are growing earthworms in large quantity in farm-waste for this purpose.

The other year I wrote of efforts to conserve the Tecoma pup fish in U.S.A. It's now extinct. Nevertheless,

conservation of rarer fish continues. The underwater reserve set up off the Mediterranean coast of Monaco in 1976, ranging from 2 to 35m depth and covering 50 hectares, where no fishing is allowed, has quickly attracted its former fishes, by sinking artificial reefs of natural rock, building materials and concrete-slabs at various depths. They lured sea-breams *asotus*, scorpion-fish *serofa*, chromids, rainbow-wrasse, etc.

#### Seaside waterlife

Life in our seaside waters is much more complicated than collecting a few specimens for microscope or aquarium reveals. In Liverpool Bay, for instance, the plankton activities cause higher ammonia and nitrogen-levels in the sea off North Wales in May, but less silicate there then because the increased diatoms (microscopic algae) extract it for their cases, so attractive to look at beneath the microscope.

One of the reasons for Britain pioneering the marine biology of inshore waters is that our relatively accessible shore-lines and coastal waters have an extensive tidal range between high and low water-lines, revealing characteristically zonal formations of fauna and flora in this large inter-tidal region, with a good length of time to study it between tides. Much research continues to be aided by over £9½ million annually from the government's Natural Environmental Research Council, aiding marine laboratories from Menai Bridge and the Isle of Man's Port Erin to Yorkshire's Robin Hood's Bay, Cullercoates and St Andrews in Fife. The distribution and abundance of marine organisms was the first aim of pioneers like Herdman of Liverpool.

Such straight, descriptive essays now have a lower priority compared with attention to the variability in marine ecosystems. Direct observations on behaviour and the structure of the ecosystem with Scuba diving gear and manned submersibles or submarines could not have been obtainable by the old methods. But the U.K. lacks a manned submersible dedicated to such scientific research. It depends upon international collaboration for substituting television and underwater cameras, acoustic and radio-telemetry, sampling to penetrate the deep benthos, plus microroprocessing the results. Simulating and modelling these ecosystems need increasing access to computer

systems for storage and retrieving, analysing and comparing ever growing information.

#### German fish books

German literature on fish and aquaria is among the best, so for German-reading readers, may I mention a few of the excellent recent text books published by Verlag Eugen Ulme of Stuttgart. Helmut Pinter's 1981 *Cichliden* at 38 deutschmarks, has 30 photos and deals with Cichlids in the aquarium, which is the venue for Lothar Seeger's *Killifische* which appeared in 1980 at 38 DM with 50 photos. Gerhard Gortner's *Zahnkarpfen* (toothed carps or cyprinodonts) also. Gilbert and Legge's 251 page 1977 *Grosse Aquariumbuch* has 430 fish-photos and costs 68 DM. Herpetologists will like K. Rimpp's 1978 *Salamander und Molche* (32 photos in 205 pages, DM 36); Dr. G. Nietzke's 2 vols 1980 *Die Terrarien Tiere*, DM 68 each, totalling 49 photos of reptiles in 677 pages. Also Ludwig Trutnau's 2 vols *Schlangen* (serpents) with 122 photos of snakes in vivaria in 400 pages at DM 38 each. Rainer Schulte's 250 page 1980 *Frosche under Krotten* has 240 pages with 38 photos of frogs and toads for DM 38. For marine aquaria there is Probst's *Das Grosse Buch der Meeresaquaristik*, at DM 98.

Following the identification for the first time in England of the parasitic trout-disease called whirling disease on six trout-farms last autumn, movements of fish, eggs and their foodstuffs was prohibited from those farms in Surrey, Hampshire, Dorset, Gloucestershire and Hertfordshire, in order to contain and eradicate it. It affects chiefly young rainbow-trout now widely farmed for the food trade, but it can cause losses among young brown and brook trout. This notifiable disease gets its name because the protozoan parasite *Myxosoma cerebralis* attacks the balancing organs of fish, damaging the central nervous system, causing erratic movements, and those which don't die develop curvature of the backbone. It attacks young trout while the bones are still cartilaginous, but the parasite cannot penetrate the fish after its bones are complete. After leaving an infected fish, the parasite persists in the mud. It reached New Zealand in 1971 probably from Europe where it was first found in Germany in 1904, or U.S.A. where it first appeared in 1964 (from imported frozen Danish trout), and South Africa in 1968.

#### OSCAR



G. Robinson

# SPOTLIGHT

## Dragonflies *by L. E. Perkins*

INCREDIBLY the myth that harmless dragonflies sting or bite still persists and the misnomer of 'horsetinger' is yet in current usage. These beautiful insects have been known to man as dragonflies for over four centuries and perhaps this label has helped to perpetuate an aura of spitefulness. The voracious nymph of the dragonfly lends itself more accurately to the description of dragon as it lurks among the underwater vegetation, shooting out its hooked shovel 'mask' with which it captures its prey, thereafter drawing it back to the powerful jaws for mastication.

Unlike most insects, dragonflies do not enjoy the usual metamorphosis of egg, larva, pupa and imago (or adult) but fuse the larva and pupa into one nymphal stage during which all the structural changes necessary to equip the aquatic creature for an aerial life are carried out. Periodic skin-moulting enables these changes and growth to be maintained until, after up to two years of underwater life, the brief adult existence of only weeks may be undertaken for the purpose of breeding and continuing the species.

One of the innumerable delights inherent in a garden pond arises from the sudden visits on the part of a variety of dragonfly species, many of which are very local in distribution so that it depends upon where one lives which of the forty odd native species are likely to appear. Hawking along the garden hedges in their sporadic multidirectional flight, catching and consuming gnats and other less acrobatic insects on the wing, they continually return to the pond, sporting with others of their kind over

the water surface and pairing on the wing, sometimes separating for the female to deposit her eggs and at others accomplishing this act while in tandem.

Lucky indeed is the pond owner whose piece of water is selected for a dragonfly nursery. Although often decried as pests which will decimate fish fry, dragonfly nymphs are more likely to subsist on other aquatic life forms such as water boatmen, frog and newt tadpoles and their presence provides the opportunity for observing the emergence of the adult insect after the nymph has crawled up a convenient rush to undergo the final transformation. This exciting phenomenon affords one of the rare opportunities for examining a dragonfly at close quarters while it is compelled to remain motionless for its wings to dry and its colours to mature.

While experiencing such a fortuitous close encounter and admiring the fragility of the wings and giant eyes, it seems unbelievable that this structure has endured for three hundred million years and that large dragonfly-like insects with three foot wing spans pre-dated the dinosaurs. Even though the basic design of dragonflies has not altered from that of their large ancestors, they are superior to most other insects in a variety of fields. Some species are able to achieve speeds of sixty miles per hour and others to reverse and fly backwards with a facility matching that displayed in forward flight. The huge lustrous eye complex endows its owner with exceptional sight over distances up to ten metres which makes it difficult to closely approach an active specimen.

In one way it is fortunate that the bright colours quickly fade after death for this renders dragonflies of little interest to specimen hunting collectors. The *post mortem* disappearance of the body colours stems from the four different colour sources responsible, i.e. coloured body pigment, outer cell pigment, light refraction giving the metallic quality and from an external colour 'bloom.' The interesting but sad phenomenon of this colour fading process is better watched in reverse as the newly emerged imago insect clings, quite still in its vulnerability, to a reed while its wings become rigid and its colours slowly, so slowly, intensify.

Only in its aquatic nymphal stage does the dragonfly suffer from natural predation to any extent, its aerial agility and exceptional vision affording it a great measure of immunity to birds and other hunters once it has earned its wings.

As with all insects, the larval or the nymphal stage is when the ultimate body size is determined and insects at this stage are no more than feeding mechanisms with an inbuilt urge to attain their optimum proportions since no growth can take place after they become adult.

Broadly speaking the loose description dragonflies comprises four groups: the long bodied 'hawkers' as depicted in the accompanying plate, the stubby-bodied 'darters,' the fluttering flighted demoiselles and the little damselflies. The garden pond may be honoured by a visit from any of these but they are all beautiful and should not be regarded as unwelcome guests—they are diminishing in numbers rapidly enough without any further assistance from us.





# NATIVE GOBIES FOR THE MARINE AQUARIUM

*by Huw Collingbourne*



WALKING ACROSS almost any rocky shore in Britain it is unlikely to be long before the casual observer will notice occasional darting movements of small solitary fishes in the weeds along the edges of the larger pools, or little splashes in the rivulets running over rock and sand towards the sea. Glancing down for a better view of the cause of these movements, one will almost invariably be disappointed: the weeds reveal nothing, the sand appears undisturbed by any animate thing.

But stoop a little more closely and you may be surprised to discover that the briny water is not as empty as you may have supposed and that, huddled against a stone or a tiny bank of sand is a small fish whose mottled olive

and brown body camouflages it almost perfectly against its background.

Such a fish is likely to be one of the common gobies such as the rock goby, *Gobius paganelius*, the sand goby, *Gobius* (or *Pomatoschistus*) *minutus* or the black goby, *G. niger*.

Each species of goby differs from the others, to some degree, in appearance—for example, *G. paganelius* grows to 12 cm. and may have a brown or an orange stripe on the leading dorsal fin; *G. minutus* grows to just 9 cm. and the male has a blue spot at the rear of the dorsal; *G. niger* grows to 15 cm., is rather fuller in body than most other species and is dark in colour.

However, in spite of such variations, all the species share certain characteristics by which they may be identified as gobies. Perhaps the two most obvious features are the double dorsal fin and the joined pelvic fins.

Viewed from beneath, the pelvic fins of the goby may be seen to be fused into a single sucker-like structure. This particular adaptation serves the valuable function of allowing the fish to stick itself firmly upon the surface of a rock in defiance of the harsh buffeting of the waves which crash upon the shore as the tide advances or recedes.

Although there are some types of goby which swim mid-water, only one of these species is native to British waters—the spotted goby, *G. rathensparri*. All of the other species are bottom-dwelling.

In the aquarium gobies are lively creatures, for ever wriggling up through the water in search of some morsel of food which they have spotted, before dropping again like a dead weight to the aquarium floor.

They are undemanding animals and are gregarious by nature. Most of the shore-line gobies may be acclimatised to life in a tropical aquarium although I always prefer to replicate as closely as possible their natural environment in a temperate aquarium.

Capturing some gobies at the seaside provides comparatively few problems. Unlike many other types of fish, the goby is unlikely to attempt to avoid your net with quick darting manoeuvres. It tends, instead, to rely on its protective colouring, remaining quite motionless until approached at very close quarters.

The art of catching gobies relies upon keen observation, a steady hand and a final movement speedy enough to scoop the fish up before he has had time enough to work out just what is happening to him.

But it is not only in rock pools and sandy rivulets that these fellows are to be found. Try looking under stones, even those which may appear to be embedded in water-covered sand.

Often, in narrow channels or small pools, the goby will retreat to the very edge of the water in an attempt to escape. Thus cornered, it will sometimes jump out of the water and onto the land. This may well be an effective means of avoiding an aquatic adversary but it is not likely to prove effective against the cunning aquarist. Out of water the goby is less agile and may easily be picked up in a net or by hand, popped into a waiting jar and then transported home to its new place of residence.



THE TENCH (*Tinca tinca*) is a member of the carp family, and is found in similar waters to those enjoyed by the carp. Tench prefer water that is only very slow moving or still, with plenty of underwater vegetation and a thick muddy bottom. This fish can, in fact, tolerate conditions which would cause even the hardy carp some discomfort. It is the most sluggish of our native freshwater fishes, tending to avoid bright light by spending the daylight hours hidden in the bottom mud or amongst the weeds. Occasionally, if the day is warm and sunny and the water surface calm, it may rise to lie motionless beneath a lily pad, but if disturbed it will immediately dive back into the water depths. Normally, the Tench prefers to make its excursions during the night, when it will browse on the plant life and eat worms, insect larvae and snails together with any other food that is easily caught—for this slothful fish is generally too lazy to pursue anything capable of fleeing.

The wild Tench is also known as the Green Tench and the Doctor Fish. The latter name was given to the Tench by old writers who accredited to the fish's slimy covering great healing powers, believing that the fish would rub its sides against any other wild fish that had a wound and so heal it. There is, of course, no truth in this belief.

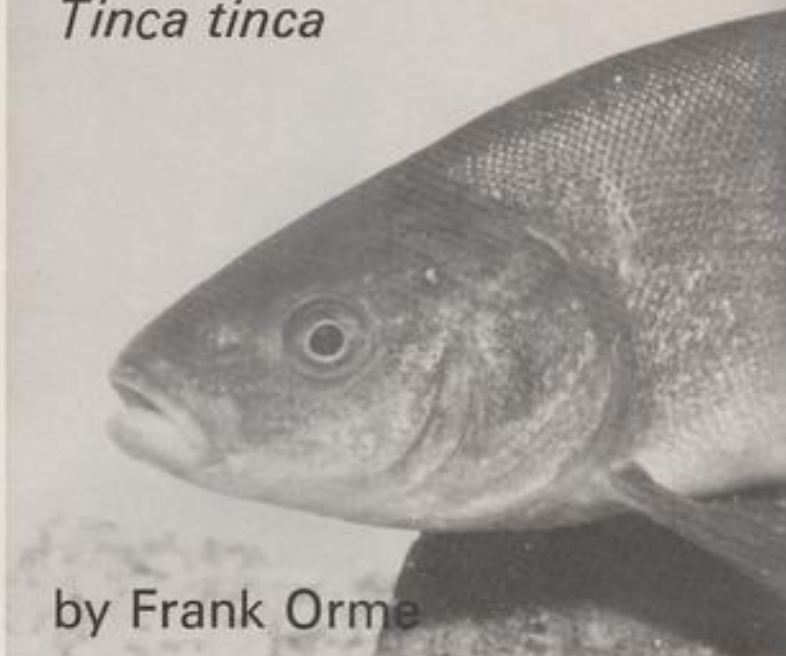
Tench are very hardy, and young specimens are suitable for the aquarium. However, to obtain maximum growth the Tench is more suited to life in a spacious outdoor pond even though it may be seldom seen. It is distinguished from other members of the carp family by the many small goldenish scales along the lateral line. The rounded back and rather stout appearance gives an impression of a cylinder. The snout is short, with an oblique mouth that has a small barbel on each side, near the corner. All fins, including the caudal, are rounded, varying in colour from deep olive to blackish-brown. The body is olive-green on the sides with a muddy brownish back; it is very slimy due to a heavy covering of mucus. There is also a cultivated golden variety of ornamental Tench.

## Native Aquarium Fish

# THE TENCH

*Tinca tinca*

by Frank Orme

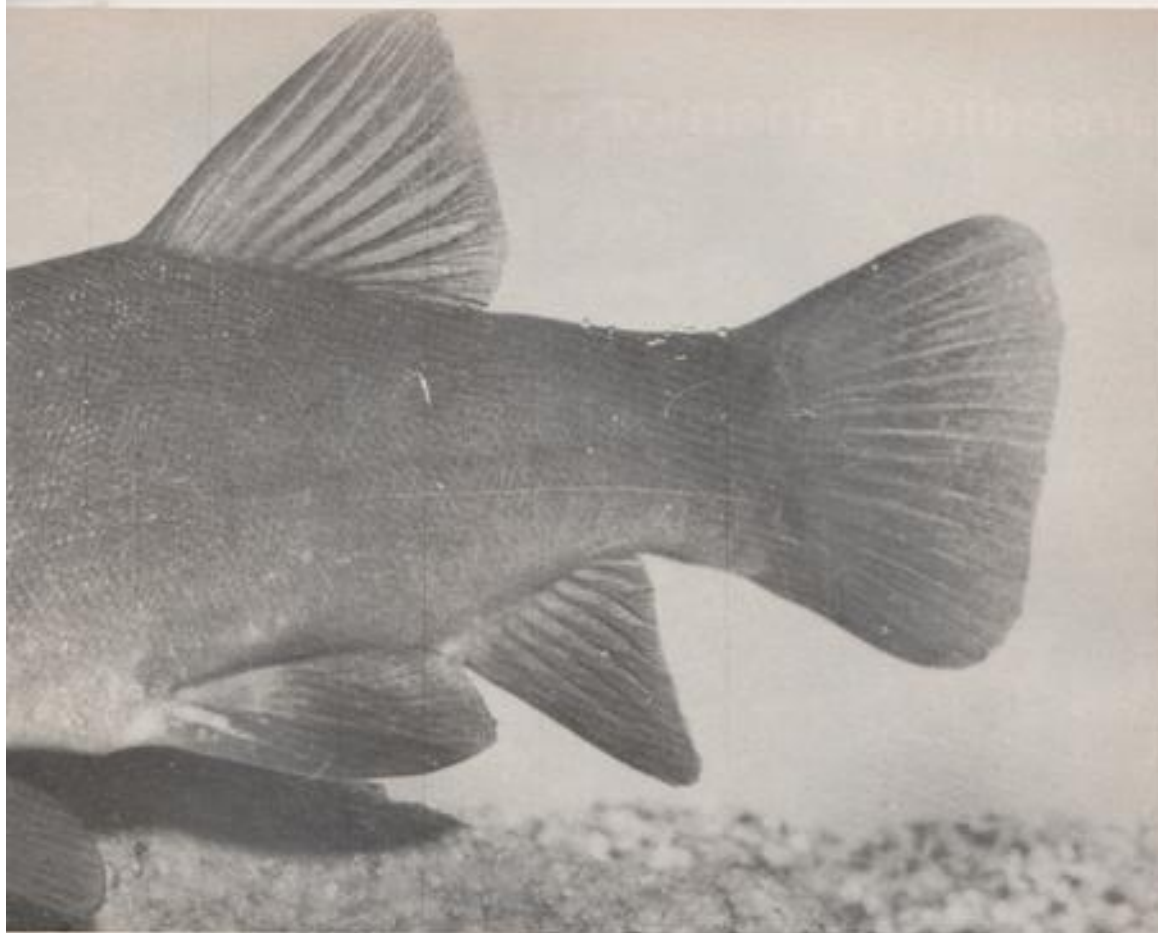


Like the carp, the Tench spends the cold winter period in a torpid condition, buried in the bottom mud of the deeper water of its home. For the rest of the year it is safe only in very weedy water, where the dense vegetation offers some protection from would-be predators. Should Pike find their way, or be introduced, to the waters then the Tench would be exterminated within a comparatively short space of time—being too slow to avoid the jaws of this predator.

One of the latest of British freshwater fishes to spawn, Tench breed between April and August. Spawning is not a continuous act but takes place over a period, with several intervals between. The adult female can produce around 300,000 eggs; these are small and are deposited amidst the plantlife of shallow waters, where they are fertilised by the male. Under favourable conditions the eggs

will hatch within a few days, the young developing quickly. Young Tench can grow to reach a weight of around  $\frac{1}{2}$  lb. in the first year of their life. It is impossible to rear young Tench to full maturity and size in the average aquarium, however but if the tank is large enough there is no reason why they should not be reared for a time therein before being placed into the pond.

Being such a hardy fish, and tolerant of poor water conditions, the Tench is quite suitable for inclusion in the garden pond where it will live peacefully with other species of fishes with similar harmless natures. Although it may not often show itself it will, no doubt, employ itself usefully by clearing up any food that has been overlooked by the more active and colourful fishes. It may not act as 'doctor' to the other occupants of the pond but, by scavenging, it may



well help to remove a possible source of pollution. The pond must be of adequate size—no fish can be expected to do well in some of the small preformed pools that are offered for sale. These are often so restricted in swimming area and depth that the fish has little, if any, chance of escaping the attention of marauding cats or other predators. Pollution in such a small body of water is a very real danger. During hot weather the water will quickly overheat and this, combined with the resultant lack of dissolved oxygen, can soon lead to the death of the fish. Remember that a well grown Tench can grow to a length of around 10 inches and such a fish needs plenty of space if it is to develop to its full potential and not become stunted.

Aquarists will find young or adult specimens of either the wild or cultivated varieties of the Tench of

interest. It may, of course, be possible to obtain one or two wild Tench from an angler, or by catching them yourself. However, although it is unlikely that the local pet shop will be able to offer any Tench for sale, very often, during the season, the larger aquatic dealers do carry supplies of these fish—especially the cultivated golden variety—and advertise this fact in the columns of this magazine. As always, play safe and first quarantine the new acquisitions—irrespective of where they have come from—before liberating them to mingle with any other healthy stock.

Those who either do not have a pond or prefer to be able to see their pets, should provide as large a tank as is feasibly possible and stock it with fish that are already well grown. Cover the bottom of the tank with a good depth of well washed gravel and stones, and plant with strong rooting

plants that have been allowed to take a firm hold before the fish are introduced. Exercise the usual attention to the maintenance and care of the aquarium and its inhabitants, and feed with earthworms, whiteworms, crushed snails, together with all the usual Goldfish foods, and the Tench will be quite content to settle down to the protected life of a pampered aquarium inmate for many years.

# Breeding Anemonefishes Part 1

by Dr. Robert J. Goldstein



The dusky damselfish, *Pomacentrus fuscus*, is among the most common Bahamian shoreline damselfishes, with spawning pairs seen in very shallow water

NOTHING IS EVER so difficult as when one goes about it the wrong way. That has been the history of the marine aquarium hobby. Logic, rather than experience, dictated what we ought to do, and as a result we haven't managed to get very far. The problem goes back to the origins of marine aquarium keeping. In the United States, the pioneers were Robert Straughan and Helen Simkatis. One could hardly pick up a copy of *The Aquarium* without reading about how it should be done, complete with black and white photographs of lovely little, live marine fishes. Because the fishes were alive, we assumed that the authors were giving correct advice.

Some of the advice has been found to be all wrong. We were told not to place any old rock in the aquarium, because it might leak toxic substances such as heavy metals. (Yet today we flood our aquariums with levels of copper comparable to mine drainage.) We were told to keep out any rocks, coral or shell that might be a hiding place for decay. We know today that without hiding places or territory markers, many fishes will have washed out colours, confused and frightened behaviour, and tend to hide in a corner or jump at the slightest movement in the room.

We were told to siphon the tank constantly, to remove all sources of pollution. Today, we know that a tank must cycle with decaying materials in order to produce the bacterial populations that will dispose of normal toxic wastes. This is the principle of biological disposal and conversion of normal nitrogenous waste products.

And so we have learned that those early ideas were wrong. Today we are learning that our normal ways of doing business continue to be found either wrong or not as good as they might be, and we shall continue to learn from experience and testing of new ideas.

One of the recent principles I learned, from this magazine as a matter of fact, was that marine fishes do best on a sparse diet. I was raised on the freshwater aquarium principle that to grow fish, one must feed frequently and change water regularly. More food in, more fish body out. All that accomplishes in a marine aquarium, however, is unnecessary loading of the aquarium with organic materials which the fish do not need, but which decay organisms will make use of, discharging acids as an end product. Water changes are also part of the marine aquarium ten commandments. I am finding that, under conditions of non-crowding (one inch of fish per 15 gallons of water), light feeding and a good biological filtration system, water changes can be greatly reduced to the level of a tonic, rather than a necessary part of keeping fish alive.

Before describing my breeding experiences with *Amphiprion ocellaris* and the set-up that I use, let us first take an overview of clown or anemonefishes, and the entire family Pomacentridae, and look for more myths.

Bohlke and Chaplin, writing in *Fishes of the Bahamas* (1968) estimated that there are some 200 to 225 species of Pomacentrid fishes worldwide. The most recent *List of Common and Scientific Names of Fishes from the United States and Canada* (1980) puts the American and Bahamian species total at 14 Atlantic and two Pacific kinds. For aquarists, Randall's *Caribbean Reef Fishes* (1968) remains the most widely available, inexpensive source of information on these fishes from the Atlantic, although new reviews are constantly being produced.

Bohlke and Chaplin point out (as do almost all writers) that the Pomacentrids are fishes of the coral reefs. That, in my view, is simply another shibboleth that we must discard. While many Pomacentrids are found on coral reefs, they in fact are not dominants on these reefs. The reefs contain large numbers of fishes from very many families, with Serranidae, Labridae, Blenniidae, Clinidae, Pomacanthidae, Chaetodontidae, Scaridae, and many other families sharing the habitats. If any fish are dominants on reefs, it is probably the wrasses (Labridae), although the dominants will vary from region to region



*Premnas biaculeatus* lives only in one kind of sea anemone in nature

The blue devil, *Pomacentrus caeruleus*, is a typical damselfish in shape



and even from reef to reef. Pomacentrids are there, of course, but they are not dominant.

Where, then, are the Pomacentrids? They are, in my view, not so much reef residents as they are residents of the reef periphery. Thus, we have the *Gironis* types (elongate, fork-tailed plankton feeders) feeding in the water column above the reef, rather than on it, and often quite a vertical distance removed from the substratum. Many of the other Pomacentrids are dominants in only one place, and that is the shoreline areas of rubble, limestone, and dead coral. They occur at the edges of grass beds, within bed clearings, along the shoreline, in sandy stretches where a territory marker with a hard substrate is available (a tin can, bottle or rock), or they exist in tide pools on rocky or volcanic shores.

This is not true merely of the juveniles. While some Pomacentrids will only be found as juveniles in the near-shore, shallow surge zone, there are quite a number of species which breed in these areas. Any visitor to a Caribbean island will have seen any number of male Pomacentrid fishes guarding vast patches of eggs that covered much of a beer can or wine bottle in two feet of water. And he will have seen vast numbers of juveniles of several species of Pomacentrid scattered all over the beach frontage, from pier or wharf pilings to grass patches, to cinder blocks to cans and old boards struck in the bottom, and all in water as shallow as just a few inches in depth. Here is where Pomacentrids are dominants: in the surf zone, the subtidal zone of shallows where the reef materials are mostly dead, or far above the living reefs in deeper water. This is the situation in the Atlantic waters with which I am familiar, and my readings indicate that a similar situation prevails in the Indo-Pacific region. Thus, one must ignore the writer's overview and read specifically where each fish species is most likely to be found.

In the Atlantic, only one species of Pomacentrid is invariably found associated with a coelenterate. That is the yellow-tailed damsel or jewel fish, *Microspathodon chrysurus*. Always found with yellow, stinging coral, the fish occurs typically where the coral has a high relief and strong water surge to bring it food. In the Bahamas I have generally found both the fish and good stands of the coral in shallow water where strong surges made collection of the fish difficult. It dashes into crevices in the coral when approached, and the wave action tends to throw the swimmer against the stinging coral. My extensive experience collecting this fish has convinced me that it is better to buy one than catch one! It is virtually impossible to avoid being thrown into the stinging coral, and it seems only to happen after one is already sunburned in those areas!

Thus, of the few Pomacentrids in the Atlantic, one of them has an almost constant (required?) relationship with a coelenterate, which provides both habitat and protection to the fish.

In the Indo-Pacific region, there are very many more kinds of Pomacentrid fishes. One of the best old reviews is Montalban's (1927) *Pomacentridae of the Philippine*

*Islands*. This is available from the Smithsonian Institution T.F.H. Reprint Fund as *The Philippine Bureau of Science Monographic Publications on Fishes* (Smithsonian Institution, Washington, D.C. 20560, U.S.A., U.S.\$5-50 plus shipping). As most of the marine fishes in the hobby come from the Philippine Islands, this work is indispensable to the general marine aquarist.

The predominant Pomacentrids in the Indo-Pacific region are members of the genus *Dascyllus*. While many of them occur with dead coral, there are two species (*D. albisella*, *D. trimaculatus*) which often associate with sea anemones, apparently resistant to the stings, and using the anemones as hiding places, habitat markers or homes of a sort. Thus, we see the propensity of Pomacentrids to associate (one kind in the Atlantic, at least two kinds of *Dascyllus* in the Pacific and possibly more) with stinging coelenterates as a form of protection, which keeps them in one place.

Is being in one place a part of this association? Probably, because of the various kinds of fishes associating with floating jellyfish, adult Pomacentrids are not included in the mix. I have often found juvenile sergeant majors (which as adults do not associate with coelenterates) under the bell of floating jellyfish, but never any kind of Pomacentrid adult. Perhaps this is because jellyfish do not provide any substrate for egg laying and incubation.

It then seems a natural evolutionary step that certain Pomacentrids would take the association a step further, and make use of the sea anemone habitats available as a new kind of life-style.

Many fishes associate with sea anemones. Even the wrasse, *Thalassoma amblycephalus* has been determined to be an anemone-fish by Schlichter in the journal, *Marine Biology* (1970, pp. 269-272). But not all anemones are suitable for fishes.

Of the hundreds of kinds of Indo-Pacific sea anemones, just ten species have been found to typically be habitats for anemonefishes. Many of these anemones have little in common except that they tend to occur in shallow water with strong surges, rather than typical deep water live reefs. Again, we see the association of the highly specialized Pomacentridae with stinging coelenterates on the periphery of the reef. While some occur on the reefs proper, they are not dominant fishes in those areas. They are only dominants in shallow, dead coral areas. Some of these sea anemones occur not on dead coral at all, but root themselves in sand. Yet they serve as homes for anemonefishes. The fish solve the problem of a hard substrate for spawning by finding a nearby object, such as a tin can, and pushing it toward the sand-embedded anemone until the object comes to rest against the anemone's stalk. Then spawning can proceed.

One kind of sea anemone appears to influence several species of anemonefishes. If the anemonefish occupies this kind of sea anemone, its colour darkens so that the fish eventually becomes black with white bands, rather than yellowish brown or reddish brown. If these black fish are placed in another kind of anemone, they revert to the more common colour. Colour then is not fixed, but

an adaptation which is reversible. Why this occurs only with one kind of sea anemone but not others is unknown. How it occurs is also unknown. The fact that it occurs is remarkable.

To understand anemonefishes requires knowing something about the anemones in which they live. Daphne Fautin Dunn has just published *The Clownfish Sea Anemones* (1981), a scientific treatise with a wealth of information that is available to Europeans by sending U.S.\$9.75 to The American Philosophical Society, 104 South Fifth Street, Philadelphia, Pa 19106 U.S.A. This work will undoubtedly not be reprinted, and will certainly become a classic.

How does one sex anemonefishes? Is it necessary to purchase six young ones in order to have a reasonably good statistical probability of getting a pair?

Anemonefishes have been discovered to be more accommodating than that. Moyer and Nakazono, writing in the Japanese Journal of Ichthyology (1978, pp. 101-106) discovered that six species of *Amphiprion* were protandrous hermaphrodites. Combined with an earlier study by Moyer and Bell in the same journal (1976, pp. 23-32), the following situation was discovered to prevail in most anemonefishes.

Typically a sea anemone was occupied by about three to five fish of one species. The largest individual was invariably a female. The next largest was a functional male. The remaining fish were immature. When the female was removed, the male grew larger and became a functional female, and the largest of the immature fish became the functional male. And so, there was always a pair of fish at the anemone, with reserve fish among the folds of the tentacles. For aquarists, what does this mean?

It means that when you go out to buy anemonefishes for breeding, you do not buy the two biggest fish in the shop! You buy one big one and one or a few small ones. If you buy two big ones, the odds are strong that you might be getting two females, one of which will worry the other to death by beating or starvation. You only need two fish, a large and a small, to be assured of getting a pair. But because the small ones are typically inexpensive, it makes good sense to pick up a couple of reserve fish to provide not only backups to your breeders, but for purposes of having dither-fish (see *Cichlids*, for an explanation of dither-fish).

While many writers have emphasized that one does not need to keep anemonefishes with sea anemones, all agree that the fish do much better with a sea anemone. I should like to point out that sea anemones do much better with anemonefishes than without them as well.

Typically, sea anemones lacking anemonefish must be fed an occasional piece of fish or invertebrate (always fresh, never decayed). They then go through periods of swelling, contraction and regurgitation. They alternate between looking lush and in full flower, and in contracting their tentacles and appearing to be about to leave this world. Often they die at the end of the contraction and withdrawal period of the cycle. When kept with anemonefishes, however, they are constantly groomed, touched,

brushed, nestled within, and always look happy as clams, in full flower.

Which anemone should go with which anemonefish? Dunn has listed those associations which have been documented in the literature and from personal observations. Suffice it to say that most anemonefishes will adapt in aquaria to just about any anemone from the Indo-Pacific region that is large and that has been shown to harbour any other kind of fish. What happens in nature is a matter of competition and opportunity, and not a strict physiological relationship.

Where one kind of clownfish is the only species in the area, it often occupies a number of species of sea anemone. Where the fish's range overlaps with that of another species of clownfish, the two fish generally divide up the anemones, with one fish taking one species of anemone, and the other fish species occupying another species of anemone.

But it can get more involved. *Amphiprion frenatus* tends to occupy one kind of sea anemone, and will fight off all comers to predominate where those sea anemones occur. But giant specimens of that sea anemone are very attractive to *Premnas biaculeatus*. *Premnas* will drive *A. frenatus* away from all giant anemones, and take them over itself. Behaviourally, this is surprising to an aquarist. We think of *frenatus* as aggressive toward all other fishes, but *Premnas* as rather mild mannered, except to its own kind to which it is vicious.

The situation determines the relationship and its outcome, and we cannot make generalizations that will always be true.

To learn about the behaviour and taxonomy of the fishes, it is important to select good reading material. In addition to Dunn, there are two books by Gerald Allen on the subject, *Anemonefishes* (1972, T.F.H.) and *Anemonefishes of the World* (1980 English Edition, Aquarium Systems). Which is better? Neither. They are quite different, supplying different kinds of information. The earlier book has the substantive taxonomic and descriptive material necessary to a scientific understanding of the fishes, while the latter has more ecological behavior and updated taxonomy of the sea anemones. I think every serious marine aquarist should own both.

In the next part of this two-part series, I will describe how to set up a breeding aquarium for anemonefishes and the results of my efforts to raise the fry.





Tomato clown / *A. melanochirum* in foreground with *A. leucifasciatus* behind



**Alternative applications for the NOVA Heater/Thermostat** by Barry Durham

THESE ARE times when, as an aquarist, I don't really take a wide enough view of things. You tend to get used to applying a piece of equipment strictly to your own little area without realising its wider utilisations.

Like the time I tested the 'Nova' thermostat for *Uno*. I am still firmly convinced that it is the best 'stat an aquarist can buy after looking at all the implications from a fish-keeping standpoint.

I can also appreciate the fact that it would be a boon to photographers who want to develop their own films. Having tried my hand in the dark room vainly trying to maintain temperatures within half a degree to stop my colour slides having a mottled appearance, I can see that it would ease those sort of difficulties considerably. But this little unit also has its other uses.

My father made a vain bid for it to use in his own hobby of wine-making, realising that its accuracy would help keep the temperature of fermenting wine almost totally stable and so produce better quality wines. And I almost lost it to a friend who keeps reptiles who had been looking for an accurate thermostat to work in air, as opposed to water, for some time.

Now two of the uses for this versatile little gadget are rather outside the scope of this magazine (unless you like taking photographs of fish pickled in alcohol!), but its



applications for reptile and amphibian keepers are rather more in my line.

The first thing that springs to mind is the terrapin. That humble little creature that is sold as a baby in the summer to be kept in a small open dish in the living room until it expires from cold at the first onset of winter.

Unless, as aquarists, you realise that these are Tropical creatures and need to be treated as such. I don't even like the idea of simply giving them an inch or two of water to paddle in. Ours thrived in a proper tank that had a beach and rocks and was Half Full of water which allowed them to actually swim. However in these circumstances some form of heating and temperature control are necessary—and as terrapins are quite playful creatures it is also necessary to limit the number and size of the things you have to put in the tank. They will climb or rest on anything so being able to control the temperature by a simple probe is great.

The 'Nova' does also work well in air and can be used very effectively when keeping reptiles.

I asked Mr Walter Smith, whose shop in Tib Street, Manchester, is well known for its reptiles and amphibians, what he thought about the uses of the 'Nova'.

Once again the fact that only thing going into the vivarium was a small probe impressed him, and he thought it would be a very effective instrument for keeping reptiles.

"You have to remember that reptiles like the Italian Wall Lizard, Green Lizards and Grass Snakes like conditions to be dry," he said. "This unit could be connected up to a lamp in a hood over a tank which would then provide enough heat for about eight hours a day. If things got too warm the thermostat would switch the light off and let it cool down a bit."

Mr Smith also pointed out that the 'Nova' could be very useful in situations where only a small amount of water was used. Chameleons apparently like things damp and of course so do the various types of frogs. The small probe of the 'Nova' in the small amount of water would still ensure it kept at the right temperature.

Being based on silicon chip technology there are no moving parts (so no sticking contacts) and the accuracy is within  $\frac{1}{2}^{\circ}\text{C}$ . Warning lights to show of any heater failure are another good point, and the simplicity of its connections (complete with earth wire) and the comprehensiveness of the instruction leaflet are other points in its favour. Add the fact that only the probe enters the vivarium or aquarium, and the actual working unit is attached to some convenient point well away, and you can't fault it from a safety point of view either.

It is tamper-proof, suppressed to stop any TV interference, and made with components subject to strict quality control. Adjustment is carried out by a small knob on the top of the thermostat housing with 75°F coming conveniently in the centre of the scale (I still hope they eventually get round to calibrating it properly however!).

For the aquarist, reptile or amphibian keeper who wants the best, most accurate warmth protection for his charges then the 'Nova'—even at around £15—has got to be at the top of his list.



## Koi enthusiast

R. Sharp

IT IS ABOUT 25 years since I first fell under the spell of fish keeping. Since then I have enjoyed keeping and breeding fish, both cold water and tropical varieties.

My garden shed contained 27 tanks of various sizes. With a marine tank in the house and a fibreglass pool in the garden, I thought that I was quite complete—until 6 years ago when I was introduced to Koi. I already had 3 Koi—about 6 inches long—in my pool, but that was as far as my interest in them went.

Being totally absorbed in breeding tropicals in a cosy shed, cold water fish keeping seemed worlds away. Looking back I realise what a narrow outlook on fish keeping this was.

At this time I was chairman of the local Aquarist Society. I was asked if I would make up a party to visit a neighbouring society in Derby. They were to have a visit from Roland Seal, a member of the British Koi Keepers Society. He was coming from Manchester, and they wished to make his visit worthwhile by filling the room. This seemed interesting and was so arranged.

What an evening. As the lecture progressed I couldn't believe my eyes. Fish up to 3 feet long. Pools of up to 10,000 gallons: and pumps running 24 hours a day to operate filter systems. It was explained that these large pools belonged to very prominent Japanese people and that all these things could be scaled down, thank goodness!

Slides of the fish were incredible. Never before had I seen fish like these. Reds, whites, metallics and all with their own names: Koaku, Shusui, Ogons, Hariwake and many more.

I came away from that lecture very quiet. Liking what I had seen and already wondering what I could do to improve my own pool. After all, it was only the previous summer that the garden had been covered with crazy paving and new turf and, of course, the fibreglass pool. There was only one way to improve this pool. Dig it up. Sell it, and start again. And this is what I did.

### The second pool

This pool was built at the far end of the garden on the site of the fibreglass one. I realized later that this was a mistake for to view the fish from the house meant sitting at the bedroom window.

The pool was 10 feet by 6 feet and 3 feet deep, holding about 600 gallons; quite a size to me when you consider that the fibreglass one held only 130 gallons. Three choices now faced me—Fibreglass, Liner or Concrete. Ready made fibreglass pools didn't come in this size and would probably be costly, and I didn't know of anyone who had used a liner. So I decided upon concrete—though not the usual one piece construction. Working single-handed, with shattering and mounds of concrete, I thought that a one piece pool would be too much of a race against time. I decided upon a concrete raft of 4 in. and to build the walls from 18 in. × 9 in. × 9 in. concrete blocks. The blocks would then have to be rendered and pond-sealed.

### Filtration

Undergravel or external filtration was now my next decision. I chose undergravel. It was cheaper and easier to construct and took up no extra room as it was built within the pool. This consisted of a retaining wall, being built within the pool, across the width, approximately 15 in. high to hold the filter media. The pipework was of  $\frac{1}{2}$  in. bartol with  $\frac{3}{16}$ th holes drilled through and connected to a submersible pump.

From start to finish it had taken me about 4 months. Now with the pool filled and the crazy paving re-laid I could sit out, for what was left of the summer, and enjoy what had been done. Now I was satisfied. I had a 600 gallon pool and room for more Koi.

I found myself going farther and farther afield for fish, and during one of these trips met Mrs. Hilda Allen who recommended that I join the British Koi Keepers Society. This I did and, of course, became more and more drawn towards Koi, especially after seeing what other people had achieved. I found that there was a lot to be gained by having the correct information—which I found was always given freely and enthusiastically by all B.K.K.S. members.

Of course, it didn't take my wife and I long to realize that the pool ought to have been larger. By now my wife, too, was bitten by the bug and this was to make life much easier in the months ahead when the whole garden had to be dug up yet again.



Pool 3 dug out and showing why the wife should also like Kol



View of construction from within the pool

## MATERIALS

300	18x18x9	CONCRETE BLOCKS
44		BAGS CEMENT
6TON		DALLAST
5YDS		WALLING STONE
1/4 18"		CORNER STONES
200-18x18		COLOURED SLABS
6TON		BUILDING SAND
6CMT		WASHER SAND
1		MANHOLE COVER
20FT 2"		PLASTIC PIPE
120FT 1 1/2"		PLASTIC PIPE
6FT 4"		PLASTIC PIPE
1 2"		GATE VALVE
2 1 1/2"		GATE VALVE
2		PUMPS
3TONS		GRANITE CHIPS
2PNT		SIL GLAZE
		AKWASEAL
		PLANTS

Pump house and main drain valve

Garden and pool completed





### Pool number three

This time had to be the last. With improved information I could plan much better. For example: how big? Could it be made nearer to the house? What about bottom drains etc?

We wanted to be able to sit and have our meals and at the same time be able to watch the Koi feeding; and I didn't want to have all my meals at the bedroom window.

By joining the old to the new and by building towards the house, I could come within 10 feet of the kitchen—making the pool around 27 feet and a total capacity of about 3,000 gallons.

The end of the old pool was cut away with a power saw. Another concrete raft, 1 foot lower and 2 feet wider than the last one, was laid towards the house. The new pool walls overlapped the old ones for about 2 feet to make the join. Different base levels were overcome by sloping the joining concrete.

Undergravel filtration was still to be the choice and was to be situated at the house end of the pool—making a total width at this end of 10 feet.

All new slabs were laid in the surrounding area, matching the type used as coping stones to finish off the top of the pool.

I planted leylandii trees down the right hand side to eventually give shade to the pool on prolonged sunny days.

It is now 2 years since the pool was completed, having taken a year to build. The leylandii are about 5 feet tall

Pool as it is today

now and perhaps next year will give the shade that I originally intended.

During the past 2 years I have managed to find room to add 2 external filter bays. These supplement the undergravel filtration and also take away floating particles. The pergola helps to give shade and also to add a little more interest. Finally I have added a spotlight. This way I can enjoy the Koi not only by day but also into the night—especially in the winter when the days are short. In previous years, I am ashamed to admit, from October to April I found myself tending to forget the existence of my fish.

I hope that this article has been of some interest to other Koi 'nuts' and to more same readers at the same time. If more detailed information with regard to pool construction, filtration or care of Koi is of interest to anyone, then I can most strongly recommend that they join the B.K.K.S. without whose help I would most certainly have lost fish.

Pool construction is no easy task and cannot be done in 5 minutes. It breaks backs and sometimes spirits too—especially when holidays are forfeit for the benefit of fish. It is, however, all worthwhile when you can sit by the side of the completed pool on those lazy, sunny days and warm summer nights and watch these living jewels. For that is what they are.





Male on left showing courtship display

## A Toothcarp with a reputation

by Rudolph Zukal

NOT AS MUCH has been written about this fish, which appeared in Europe as early as 1909 from its natural habitat in southern India and Sri Lanka, in comparison with other species from its family *cyprinodontidae*. Aquarists avoid this toothcarp because of its reputed pugnacity and its size (10 cm). I do not share this attitude, as I have kept them with smallish characins and have never observed any aggressive tendencies. It is quite a different story where much smaller fish are concerned, such as small guppies (*Poecilia reticulata*) which are eaten with gusto. Small fish of this kind should be offered to these fish as part of their diet. The body is elongated like a pike, the mouth is broad. The males can be distinguished very easily from the females as they are bigger and more brightly coloured with numerous rows of dots which are green and goldish and extend into the red-tinged fins. The males have anal fins decorated with a border. *Aplocheilichthys lineatus* lives mainly near the surface of the water. In order to make the fish feel at home it is advisable to place a few floating plants at the surface, in the roots of which the fish like to spawn. Otherwise, this species is not a demanding fish,

which, apart from its bad habit of jumping out of the tank, has only positive qualities. A temperature of 18°C is sufficient for keeping these fish, and a temperature of 22-26°C for breeding them. The tank should be decorated in the normal way with bottom plants, with the addition of floating plants as already mentioned. All kinds of live food are accepted readily by the fish, but very reluctantly from the bottom of the tank.

Over the years this fish has often been given different names and in older literature it can be found under the names *Haplochilus rubrostigma*, *Haplochilus lineatus* and *Panchax lineatus*. For breeding, a smallish or medium-sized tank will suffice. The fish do not have any particular needs as far as the composition of the water is concerned. They spawn quickly and will readily continue to do so almost throughout the year. Generally they do not consume the eggs, but it is better to remove the fish after spawning. Alternatively, one can remove the eggs by means of a glass pipe and transfer them to a rearing tank. The young hatch after 12-14 days and as soon as they are free-swimming must be fed with very fine live food. Many eggs, which have been extruded singly, remain unfertilised. Consequently, the number of offspring is not especially large.

The pair spawning





# WHAT IS YOUR OPINION?



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

I DO NOT think any letters used in *W.Y.O.* have raised as much controversy as a couple of those written by Mr. Lawrence Belshaw. I don't know what a fish hospital is, because I've never before heard of one, but Mr. Belshaw gives his address as Fish Hospital, 82 Melbourne Road, Aspley Estate, Nottingham, and he states: "Fish Hospital will be opened by Radio Trent on 4th April, 1982." He also writes: "Mr. Whiteside, sorry about my spelling but I don't have a lot of time to sit and write letters."

Mr. Belshaw has the following to say in his long letter: "Here is an outline of my findings on *Ichthyosporidium hoferi*—*Hexamita*, or is it? How many cichlid keepers

*Macropodus opercularis*—the paradise fish



have noticed their fish going off their food, losing weight, wasting, then the fish begin spinning just before death?

"One grain of sugar is around 100 micron; *Hexamita* is between 8-12 microns—to give you an idea of its size. There are three main strains (*sic*) of *Hexamita*—*salmonis*, *intestinalis* and *truttae*, and a new strain attacking carp, amphibians and aquarium fish. *Hexamita* is also a turkey virus—parasite—and can be treated with the same treatment, fumagillin, at the rate of 0.2% in the dried food for four days—provided the intestines are not too badly damaged because *Hexamita* causes haemorrhic enterities (*sic*). Most fishkeepers think of *Hexamita* as 'hole in the head' with discus, often called 'worms in the head'. In fact, they are tufts of tissue being pushed out by *Hexamita* because *Hexamita* cannot stand a sick fish. When a fish has died of *Hexamita* none can be found in the dead specimen. This new strain is called *Hexamita octomitus symphyrodontis*—Alacher. I treat this strain on a twelve-day course with a 75% success rate.

"Over the past year I've had fish brought to me for treatment with *Hexamita* in mind. After treating 50% of these fish with fumagillin and getting no results, the fish died; so I tried some other drugs—calomel, carbarosone, arthinal furalolidone; but none of these drugs worked and two out of six fish died. I had seen the same symptoms in Florida, earlier this year, that I was experiencing here. In south Florida I saw hundreds of thousands of dollars' worth of Rift Lake cichlids dying. I took into account it was Florida's worst winter for 150 years; but as most cichlid keepers will be aware, you can drop the temperature down to 68°F; death occurs at 58°F. Fish do not feed at this temperature, but they are under great stress in this period; but provided their health is good and provided they had been feeding well before and there is no latent infection present, the fish should be okay.

"Now if *Hexamita* was the killer it's made out to be, all the fish in Florida and the ones I was treating would have died. I've made this mistake while lecturing to fish clubs. According to Uzmann, Paulik and Hayduk (*it*) is not the killer it's made out to be and does not warrant counter measures. I've always disagreed with this thinking; but my opinion has changed. The main trouble with *Hexamita* is that it's able to form cysts that can stand cold and dehydration because in Florida they used to dry the catching nets in the sun before entering (*sic*) another pond; this does not kill these cysts; nor does emptying your tank. The thinking is now that (*in*) cichlids carrying *Hexamita*, a wrong diet or stress or chill starts off binary fission—cell division—and *Hexamita* migrates into the internal organs. Well, if this was the case shipping, catching, wholesaler, retailer, etc. would be enough to bring on an attack of *Hexamita*.

"After around 150 post mortems I found *Hexamita* present, but not in sufficient numbers to cause death or distress; but what I did find is large numbers of *Ichthyophonus*—*Ichthyosporidium hoferi*. This parasite is a far bigger killer than *Hexamita*, in my opinion. The symptoms are very much like *Hexamita* attacks, but they show a lot later in this disease development—especially the spinning—as *Ichthyosporidium* can attack the brain without doing (much) damage to the internal organs. Also, this disease will ulcerate the skin as in *Hexamita* but it (sic) is far more prone to fungus attack than *Hexamita*.

"I re-opened the case histories of post mortems carried out in Florida. Yes, I found *Ichthyosporidium* (sic) in large amounts; how ever I did not spot it then I have no idea. I think we were so sure it was *Hexamita* that we did not investigate enough. I tried most drugs on the fish here until I tried phenoxethol (sic) at 1% stock solution in the food while adding 10 cm. (sic) stock solution per litre a tank with only an air stone (?) 45 cm. (sic) per gallon. Then the fish death rate slowed down. The fish that died I took as so badly infected that their organs were useless. I also found chloromycetin very good as well. *Ichthyosporidium* was detected by Bruno Hofer, in 1893, as the main agent of tumbling disease. In marine fish (there is) a similar disease—*Oms mustela* and *Liparis vulgaris*. These have been named *Ichthyosporidium gasterophilum*, with related species, freshwater as well—*Ichthyosporidium intestinalis*—*Phymogenes hertwig* (sic).

"Fishkeepers who have fish showing any sign of wasting try phenoxethol (sic) for four days before trying anything else. Do not put this drug in your main tank; use a spare one that you know the right water content of, or contact me; but only with expensive ones, please, as the drug can be expensive. Fishkeepers who have angels or discus that go off their food and show a black colour, there's an 85% chance you have *Ichthyophonus* developing. The trouble with this disease is it can lie latent for up to a year—although I've only read this. At this time I don't know just what brings on a latent infection, to test this theory; but I find it a far greater killer now than *Hexamita* could ever be. I feed fish infected food and allow them to eat infected fish; but they do not contract (sic) the disease; so I think contact is through spores in the water; (that) is how mass deaths occur—of which I had three fish houses to treat, only saving one. I will list a few symptoms I've found leading to this disease.

"(1) Bellies go thin; (2) tumbling; (3) popeye; (4) dropsy; (5) layers of the epidermis flaking away; (6) black colour; (7) cysts on tissue near the swim bladder; (8) fish unable to leave bottom of tank; (9) organs nearly hard and sandy; (10) ulcerating; (11) asphyxiation; and (12) male and female becoming sterile—to name but a few. *Ichthyophonus* is a



Malayan or diamond-finned sharks

little larger than *Hexamita*; more like *Cryptobia*; around 20 microns, magnification 1,000 times; whereas (with) *Hexamita* 1,500 to 2,000 is needed; but you can see these disease cysts at around 150 and *Ichthyophonus* causing organ damage can be seen with a hand lens.

"Fishkeepers, I've found water fleas—*Daphnia*—carry this disease in large numbers. You can culture it on blood serum then introduce it into a colony of *Daphnia*; then transfer to a disease-free tank of fish. Within three weeks fish will be dead or about to die with massive internal attacks of *Ichthyophonus* (sic). Believe it or not *Tubifex* will not carry it and remain completely unaffected, but why fish don't become infected when fed with diseased food I have no idea. Whether the disease is kept at a certain level when in contact with *Daphnia* I don't know. At the moment I am cataloguing the symptoms so I can relate (sic) to this disease when I see it—although I think it will prove fruitless. As for *Daphnia*, I'm not saying if you feed it to fish they will contract this disease; I am just making an observation. Say, if you had a tank full of fish for a number of years without deaths, apart from old age, then you start losing fish; try to think if, in the past months, you fed *Daphnia*. If so, where did you collect it or buy it? If you need help, contact me. If any fishkeeper has lost fish with the symptoms I would suggest you do the phenoxethol (sic) treatment, then treat again after 21 days in case it's a latent infection. (If you meet) with no success then you may have a problem.

"As far as my liver flukes go, I'm going to re-run it again when I have the time; and as far as criticism goes I welcome it. The more we get the better we become. If fishkeepers were as critical about fish they buy as you were about me, my work load



Young brown discus—*Symphysodon aequifasciata axelrodi*

would be a lot less. This is the reason we don't have very many good fish shops in this country. There are too many shops selling rubbish and too many people prepared to buy it; and the advice they give out my five-year-old daughter could do better. So, keep up with your magazines. It's one way we can get honest opinions and good, firm advice. You are very welcome to my opening of my hospital."

I admit to know very little about fish diseases. I've made the point before that the cost of a bottle of 'cure' can be higher than the cost of replacing several young fish. I'll keep my observations brief. I note that *Hexamita octomitus* is mentioned in an instruction leaflet supplied with a German treatment called Hexa-Ex, for the treatment of 'holes in cichlids disease'. I think the sample of Hexa-Ex tablets was sent to me by the distributor in 1973. I do not know what the tablets contained.

I should point out that the distribution of antibiotics by unauthorised people is forbidden by the Medicine Act (1968). Antibiotics such as chloramphenicol, for the treatment of fish diseases, should be supplied only by a qualified vet. Dr. Robert J. Goldstein, in *Cichlids*, T.F.H. Publications, 1970, recommended phenoxyethanol for the treatment of *Ichthyophonus* and stated that the disease is contagious (a word that my dictionary shows me I was unable to spell). In the 1970 edition of *Cichlids*

Dr. Goldstein stated that the cause of hole in the head disease remained unknown. In the 1962 edition of *Exotic Tropical Fishes*, by Axelrod *et al*, T.F.H. Publications, para-chlorophenoxethol was suggested as a cure for *Ichthyophonus hoferi* (and others) by I. M. Rankin.

Interpet, of Dorking, has been marketing phenoxyethol under its brand name Liquitox for years. Prices are reasonable: 58p for the standard size and £2.19 for the breeders' size.

I had to change some of the English in Mr. Belshaw's letter in an attempt to clarify whatever points he is trying to make. I am still confused—although I admit to knowing little about the diseases of aquarium fish. Perhaps someone who is a trained expert in this specialist field would care to comment, please.

Thank you for the invitation to the opening of your 'fish hospital', Mr. Belshaw. Unfortunately I couldn't get off work; nor could I afford the return fare between N. Ireland and Nottingham.

Mr. John Carpenter, resides at 10 Thornbank Close, Stanwell Moor, Middlesex, and he is secretary of the Catfish Association, Great Britain. I should like to thank the Association, through Mr. Carpenter, for very kindly sending me a complimentary ticket and an invitation to attend the Association's Catfish Convention which will be held in Aylward Lower School, Windmill Road, Edmonton, London N18, on Saturday, 29th November, 1981. Dr. K. E. Banister and Mr. Ian Fuller are the 'big names' on the ticket. Sadly, I must decline the kind invitation, as I did Mr. Belshaw's. Too much work and too little money prevent my attending. (In November, 1981, the return Shuttle fare from Belfast to London passed the £100.00 mark!)

No. 206 Durgan Road, Grimsby, Humberside, heads a very neatly-written letter that has just reached me from Pete Green. He says: "I am nine years old and have been keeping fish for about four months now. I have four tropical fish shops in my area, of which the best is undoubtedly Victor Aquatics. You can go there, order a rare fish, and come back in one to two weeks and purchase it very reasonably. Some of this shop's latest stock includes: gold angels, horsefaced loach, Texas cichlids, etc.; and the shop has a 12-year-old pet piranha named Arnold."

If I recall correctly, W.Y.O. will be 15 years old this year. If my memory is still operating, Pete may well be the youngest reader to write to W.Y.O. I hope he'll send me another letter in his neat writing.

Mr. Lorenzo Porrelli lives at 174 Pappert, Bonhill, Alexandria, Dunbartonshire, and he is in the 60-plus age group. Mr. Porrelli lives in the vicinity of Loch Lomond and is rather isolated from other aquarists—which is one of the reasons why I included in the October issue a letter from him mentioning the fact that he'd be pleased to hear from other isolated aquarists. I know just how kind readers can be and felt sure that some W.Y.O. fans would drop a few lines to Mr. Porrelli. On 24th October Mr. Porrelli sent me a long letter—which included the information that, by that date, he had

received letters from 29 different readers. That's certainly most encouraging. Well done, *W.Y.O.* readers; you didn't let me down! I hope to publish more information from Mr. Porrelli in a future feature.

As usual, I received a number of club and association magazines and books this month. I was most interested to see *Information Book No. 7*, published by the Catfish Association of Great Britain. The book contains 23 pages, each of 21 being devoted to a particular species of catfish. The editor of the publication is Mr. Derek Lambourne and the assistant editor Mr. Mike Sandford. The text is well illustrated with an excellent 'drawing'—as opposed to a photograph—of each species.

The latest edition of the Coventry Pool and Aquarium Society Newsletter carries the label 'No. 327' and the date 'November 1981'. If it's a monthly publication and has reached issue No. 327 then its editor, Mr. Steven (sic) Brown has certainly been doing a good job. It consists of 16 pages of news—as its title suggests.

The British Discus Association kindly sent me a copy of their *News Journal*—which consists of 25 × A4 sized pages. The copy sent to me seemed to be the second issue and contained a lot of useful and interesting information for those interested in discus. No editor's name is given but the Association's secretary is Mr. Robin Maudsley, 102 Meadow Street, Preston, Lancashire PR1 1TS; telephone number Preston 21813. Unfortunately sections of the publication are spoiled by errors in English and/or typing. I'll quote an example—exactly as printed: "AN HONARY POSITION FOR B.D.A. EXCEPTED". This title is followed by three paragraphs, the first of which states: "An honary position has been excepted by one of the world's best known, Aquarist's and collector. Dr. Herbert R. Axelrod. Who is the president of T.F.H., the world's largest Publisher's of animal book's..." That short excerpt

Powder blue surgeonfish *Acanthurus leucosternon*



contains at least ten errors and gives the impression that Dr. Axelrod did not accept the honour proffered to him—which, I assume, is the opposite to what the author of the piece intended. The good Doctor is listed as "HONARY MEMBER" on page 2 so I assume he did accept the honorary membership offered to him. I hope the B.D.A. will get someone to correct its stencils before it publishes its next *News Journal*.

Occasionally I come across some amusing errors in pupils' written English. Recently a boy began an essay about games and sports with the fascinating sentence: "Ruby is my favourite sport..." A young lady of 16, describing minor surgery on her knee, wrote: "... As this was not a major operation I was not given an enemy..." Many of the others in my growing collection are rather rude for *The Aquarist*.

"I was very surprised, to say the least, that you didn't comment on the letter you received and printed from Master P. Crofts, in November 1981, regarding keeping African cichlids with American cichlids. For one thing, Rift Lake cichlids need very hard and alkaline water, and Amazonian cichlids need soft and acidic water. It's impossible to keep the two kinds happy together," writes Mrs. Maureen E. Hall, of 71 Saxon Road, Penkridge, Staffs. She continues: "As for *Lamprologus brichardi*, this fish has been popular since fish from Lake Tanganyika were first imported. They are timid fish that are happiest in a tank with plenty of rock work to provide caves. I find that 12-20 small—4 in. × 2 in.—pieces of slate stacked haphazardly in a corner of the tank is ideal.

"The fish are difficult to sex but males tend to have slightly longer dorsal and anal fins. I bred these fish at 1½ in. and had regular spawnings in a Tanganyikan community tank every month, with the parents and larger fry guarding the new babies.

"An old name for the brichardi was *Lamprologus savoyi elongatus*. Perhaps you can find some further information under this old name.

"I have written to Master Crofts advising him to separate his American and African fish because if this letter is published it will probably be too late for him to avoid disaster. Anyone wanting further detailed information on cichlids should join the British Cichlid Association; and anyone in the Midlands is very welcome to join the Central Midlands Cichlid Group. Meetings are held on the last Friday of every month; and further details can be obtained from me."

Photograph 1 shows a paradise fish, *Macropodus opercularis*. Please send me details if you have kept this species.

I have some good news for those who have been trying unsuccessfully to obtain Malayan sand snails. Mr. R. Newton lives at 22 Howard Road, Arundel, West Sussex BN18 9EL, and says: "Readers of *W.Y.O.* who are interested in Malayan sand-burrowing-snails can

obtain them from me—30 @ 5p plus 20p postage and packing. I hope this may help some of your readers who have had difficulty in obtaining them." (Interested readers should, of course, write direct to Mr. Newton. The section of his note "...—30 @ 5p plus ..." is somewhat ambiguous. Does it mean 30 for 5p, which is excellent value; or 30 at 5p (each)? No doubt those interested will soon find out. I hope Mr. Newton will keep a record of the number of people who write to him. He may get a shock, if I know my readers!)

Mr. Stephen Croft is 25 years of age and resides at 29 Smithy Parade, Thornhill, Dewsbury, West Yorks. He states: "I am writing my second letter to you in response to someone else's letter—as was my first letter. The letter, from Graham Clayton of Batley, appeared in the October 1981 issue. Many of my friends and I visited Colin Brigg's shop. The reason we stopped going to the said shop was because he started to split his interest between the aquarist trade and pot and garden plants. To us the standard of his fish keeping seemed to fall. It was a pity really because it was a really excellent shop, with reasonable prices. He also stocked something different now and again. Also, the shops around here are handy, but very boring in their choice of fish. The shops in Wakefield are better, but are harder to reach as my only transport is a pushbike.

"I agree with your reply to Graham about a scientific approach, and I suggest that if he wants a scientific approach he should join a specialist society. I am a member of the B.C.A. and find their information leaflets very useful. To close, the bold print for the letters took some getting used to, but it was a very good idea.

"I have some *Aponogeton crispus* which flowered, and one of my flower stems has two or three bulbous nodules. Are these young bulbs? I would appreciate a piece of information on this, please."

Readers are reminded that I accept no responsibility for the opinions expressed by contributors to this feature; and I do not necessarily agree with the opinions expressed by contributors. To be honest, I frequently disagree with the opinions expressed; but *W.Y.O.* is a forum in which anyone, e.g. beginner, expert, crank or professional, may have his or her say.

At the moment a plant of *Aponogeton echinatus*, kindly given to me last April by Dr. Vivian De Thabrew, is producing its second flower inside a period of several weeks. The plant bears many leaves. The first flower was scorched by the light bulb in the aquarium hood; and I made no attempt to pollinate the single flower stalk. This time I have carefully drawn the flower itself through the cover glass in a corner where it should not get scorched. I have also attempted to pollinate it simply by brushing a finger gently up and down the flowers. Obviously a paint brush would be more effective—but I do not have a small one to hand.

Mr. Croft asked about raising young *A. crispus* plants from seeds. As seeds of *Aponogeton* develop on the flower stem, after pollination, a little air sac forms around each seed. When ripe, the seed floats to the surface where, in the wild, it would be carried by moving water. The air sac would appear to be a seed dispersal mechanism. In an aquarium such seeds can end up anywhere; many can get lost during water changes. When the sac ruptures, usually after a day or two, the seed sinks to begin germination on the gravel surface. Here the progress of the seedling can be disturbed by, say, digging catfish; or halted by siphon tubes.

Ripe seeds may be hand-picked from the flowering stem and given special treatment. Rataj and Horeman, in *Aquarium Plants*, T.F.H. Publications Ltd., 1977, suggest that such seeds be kept in a bottle of water for one to two months, until small roots and leaves have developed—after which the seedlings should be planted in gravel in fish-free tanks for growing on.

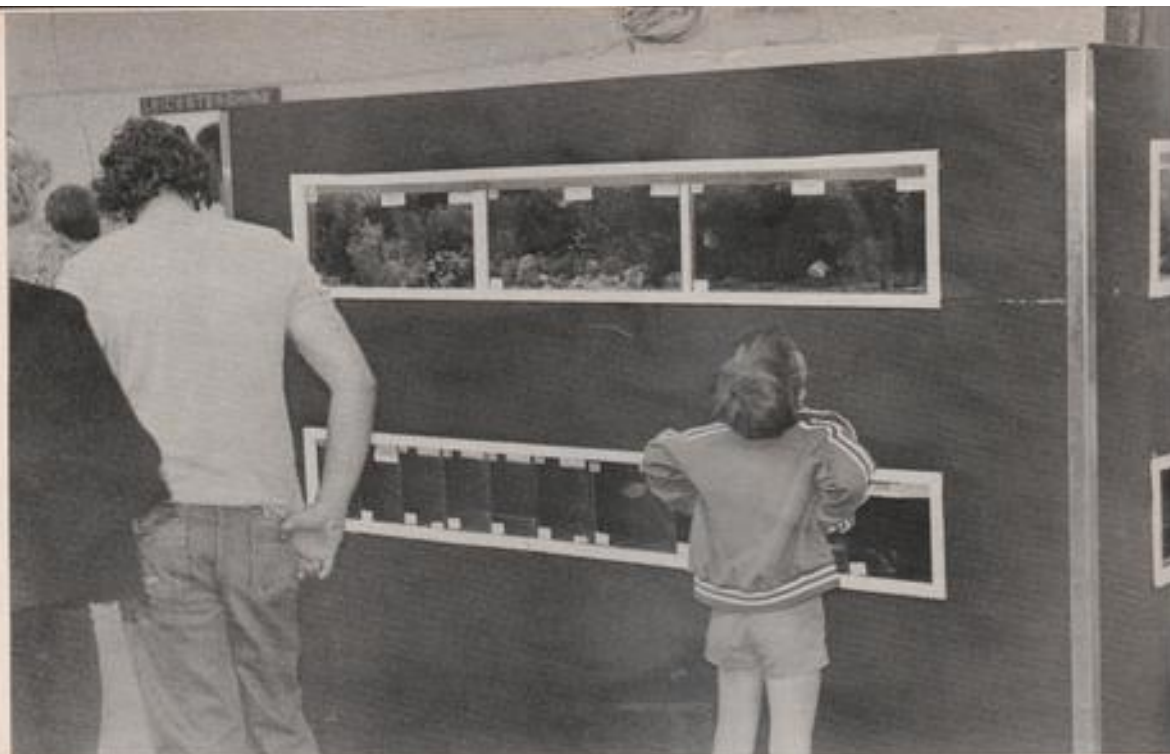
De Thabrew, in *Popular Tropical Aquarium Plants*, Thornhill Press, 1981, suggests that seeds be allowed to float for several days and then sown in a shallow dish containing sand and loam or potting compost or fine peat. He suggests  $\frac{1}{2}$  in. of water and a temperature of 74°F for quick germination. When big enough the seedlings may be transplanted.

Can you identify the fish in photograph 2. Their owner bought them as Malayan sharks or diamond-finned sharks.

Photograph 3 shows a young, brown discus, and photograph 4 a powder blue surgeonfish. Please write to me if you have kept these species. For a future feature please send me your opinions on (a) your favourite brands of heaters and thermostats, or combined units, and say why you like them best; (b) good, modern reference books about fish; (c) freeze-dried foods; (d) fresh vegetable foods for fish; (e) keeping and breeding discus; (f) dwarf lilies; (g) keeping reptiles and amphibians; (h) designs of aquarium hoods; and (i) garden ponds in winter. It's 18 years this month since my first article appeared in *The Aquarist*. Please drop me a line if you have been reading the magazine regularly each month during those 18 years.

To conclude this month's feature I decided to telephone Dr. J. Neville Carrington, of Interpet, to enquire about just how long his firm has been selling phenoxetol, under the brand name Liquitox, as a cure for fish diseases. Dr. Carrington confirmed that my choice of words, "...for years...", was appropriate. Liquitox has been on the market since 1954-5! A cure that remains popular after more than a quarter of a century testifies to its own worth. Dr. Carrington mentioned two new treatments that he will be marketing in the near future. They sound most interesting; but he asked me not to disclose names or details just yet.

Goodbye until next month.



**Furnished**

Furnished aquaria classes give plenty of scope for an individual's artistic talents to show through but, sadly, unless the show is a large one as here at Belle Vue, few societies put on furnished aquaria classes at their open shows. With a row of first prizes like that for furnished tanks this could only be Halifax's stand!

## A guide to Exhibiting Fishes Part 6

by Barry Durham

EXHIBITING at shows is not confined to the single fish classes. Most open shows put on classes for pairs and for breeders teams as well but entering in these needs a little more preparation.

When showing pairs there are extra considerations to be taken into account. They must be a sexed pair of the chosen species, i.e. one male and one female and they must also be matched, which means that they must resemble each other as closely as possible within the limits of the chosen species.

Obviously some fish show a marked difference between males and females, notably the livebearers, but this difference can also be in size, colour, finnage and even temperament and this must be taken into consideration.

Both the male and the female should be as close to their norm size as possible (or over) and they should be as close to their ideal as possible as regards finnage, body shape and condition and deportment. It is no good

having one fish quite happy in the tank, displaying all its fins and swimming quite happily in midwater when its mate sits with clamped fins on the bottom.

It follows, therefore, that pairs need a little extra training before they can be shown successfully. Both fish must be trained individually and then brought together well before the show so that they are used to sharing a show tank with one another.

Temperament cannot be ignored for some fish can be very aggressive towards one another when confined in a relatively small space. Siamese Fighting Fish are an obvious example where the male may well attack the female if the two of them are in the same small tank together. The same thing happens with some of the Malawi Cichlids and the odd livebearer (*Heterandria bimaculata* for example, although here the female is the aggressor).

Under such circumstances it is foolish to attempt to show the pair in one tank. They must be given separate quarters and a knowledgeable judge will appreciate your forethought—quite apart from the fact that trying to show them in one tank will result in one or both fish ending up with a split fin or two as well as a couple of missing scales and all your careful planning and training will have been for nothing.

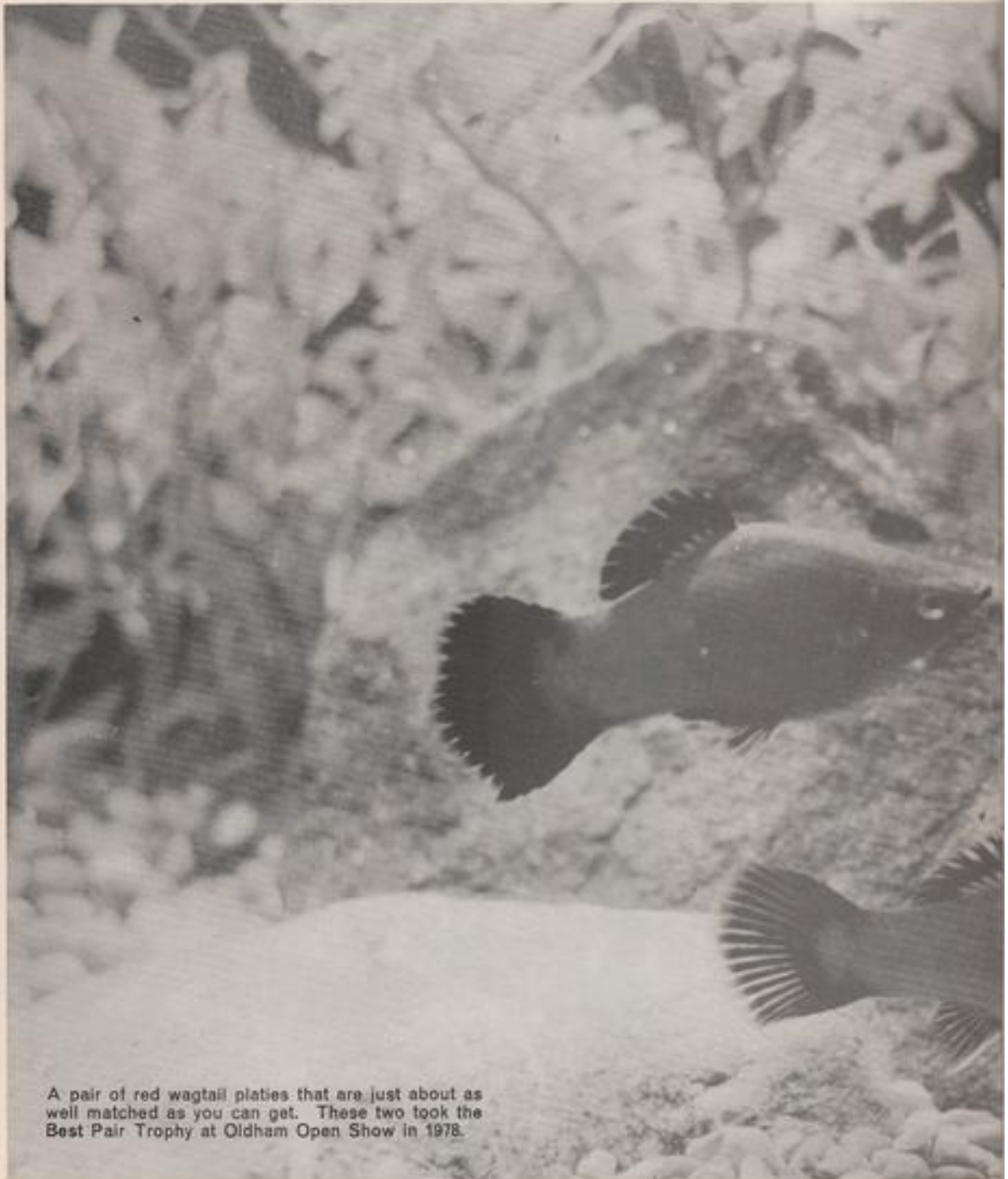
Pointing in the pairs class has slight variations between the local organisations and once again, foreknowledge of the systems used can be an advantage.

As an example, a Confederation of United Kingdom Aquarists judge will first point each fish individually under the usual five twenties system, but only score out of ten for condition and deportment. He will then assess the matching of the pair and give a score out of twenty. The scores are then added together and divided by two to give a result out of 100.

*Champion*

Where every exhibitor hopes their fish will end up one day—the Champion of Champions stand at the British Aquarists' Festival





A pair of red wagtail platies that are just about as well matched as you can get. These two took the Best Pair Trophy at Oldham Open Show in 1978.





February, 1982

#### F.B.A.S.

Federation of British Aquarium Societies judges on the other hand look at the pair as one unit giving a score out of 20 for size and matching and then using the remainder of the five twenties system to arrive at a final score out of 100.

The final result is the same but the score is arrived at slightly differently.

The Breeders' Section at the Show also covers entries for more than one fish. At small shows there will probably be just two or three breeders' classes (egg-layers and live-bearers) but at larger ones these may be split into two or four giving a total of up to eight for tropical fish as well as the goldfish and coldwater breeders' classes.

If you want to do well in the breeders' classes then you must obviously give even more forethought and planning to your entries than the single fish or even the pairs classes. First of all the parent fish must be carefully selected and if you are planning to do your breeding during the winter when there are no shows, fish that have won awards in the pairs classes could be a natural selection. Otherwise pick the best fish you get and get them into condition for spawning or breeding.

Once your livebearers have given birth or the fry have hatched from the eggs make a careful note of the date as you will have to display this on your show tank when you exhibit your team.

Feed the fry on as good a diet as possible containing as much live food as you can lay your hands on. Micro worms and micro cels are good first foods as are newly hatched brine shrimps. As the fish grow they can graduate to sifted *daphnia* and chopped *tubifex* worms and you can supplement their diet with finely ground dried food as well.

Watch the youngsters as they grow and choose the fastest growing twelve or fifteen as your 'squad' from which to select your breeder's team. Only four or six of these will actually be needed for the team (depending on local rules) but having plenty to choose from will increase your chances of raising a good, evenly-matched team.

#### Don't rear them all

Never try to raise the whole brood to maturity. A fully grown platy, for instance, can deliver as many as eighty young and a three-spot gourami about 200 eggs and to bring all these up to maturity would require a vast amount of tank space and feeding. Many of them will turn out to be small and will have to be disposed of at a later date in any case. So after two or three weeks select your best dozen or so and either pass the remainder on to friends who may be willing to take a chance on some of the fish coming good as they are out of good parent stock, or feed them to your other fish.

These remaining fish should now be given about a two-foot tank to themselves and should continue to be fed on as much live and high protein food as possible so that when the time comes for them to appear on the show bench they are as big for their age as you can possibly get them.

When you show your fish for the first time depends partly on yourself and partly, once again, on local rules and regulations. If your society belongs to the F.B.A.S. then you can exhibit your fish from almost first born up to fourteen months old. Under C.U.K.A. rules however the fish must be at least two months old and there is no upper age limit.

Two months old is about as good a time as any to start showing a breeders exhibit.

Try and aim to get five good sexed pairs out of your "squad" and if you are breeding livebearers then it is advisable to separate the males from the females as early as possible while you are growing them up. If you intend to breed off them later on it might be advisable to show the team in two separate tanks as well to make sure the females are not fertilised before you want them to be. This is quite acceptable under most sets of rules providing the tanks are not stuck together in any way. They must be separate to allow the judge to view the fish properly. Divided tanks are not allowed. Either get an additional number for your tank, or take some blank stickers with you to write the number on to make sure the judge knows that the two tanks constitute one entry.

Five pairs will enable you to choose the best when showing. Under C.U.K.A. rules the team must consist of six fish, but under the F.B.A.S. it can be either four or six fish depending on the organising Society's discretion.

#### Train your fish

When you consider your fish are approaching the age to be shown (or around five weeks old if you are sticking to the two month idea) start training them into their show tanks. Individually at first and then after a couple of weeks in your sexes or sizes. This will make sure that they are all used to sharing a smallish tank and will give their best on the show bench.

The method of scoring points varies slightly between the federations as well with 20 of the points being given for achievement in actually breeding the fish. It follows therefore that a fish that is more difficult to breed will have a head start over the easier to breed species.

The C.U.K.A. divide all fish into four categories and a code letter denoting 'difficulty of breeding' is listed in the 'norm size' book for each species. Fish in category 'A' are automatically awarded 20 points, 'B' 15 points, 'C' 10 points and 'D' 5 points. A point to note if you show in Yorkshire is that their Association's 'difficulty of breeding' categories are the complete opposite of the C.U.K.A.'s (i.e. 'A' 5 points, 'B' 10 points, 'C' 15 points, 'D' 20 points).

Picking up few points for difficulty of breeding means that you must make up the other points in the other divisions of the scale and this is where careful selection of your team can pay dividends.

Hopefully, if you have fed them well, they will be a good size for their age and all roughly the same size. You then have to pick your team taking into account colour, condition, deportment, overall quality and matching and

sex. A team of sexed pairs will nearly always have preference over a team of unequal numbers of either sex.

Make sure that your fish match each other as closely as possible in every respect and carry themselves well in the show tank. If you have trained your fish well you should have little to worry about.

#### Late Developers

One point that should be remembered is that certain species of fish mature much later than others so sometimes it will be impossible to bench three males and three females if you decide to exhibit them before maturity. This is not to say that the fish should not be shown. A knowledgeable judge will know from the date of birth shown on the tank whether the fish should be sexable or not and will take this fact into account when judging.

Apart from the fish classes at shows there are also sometimes classes for furnished tanks, mini-jars (or mini furnished aquaria) and plants. Little advice can be given on the first two because every aquarist has a different idea of what constitutes the perfect furnished aquarium. But experience has shown that in this class, perhaps more than any other, judges show marked preferences and if you are thinking of competing then it is probably best to study a few winning examples before taking the plunge yourself. Local variations in judging also apply and arming yourself with the judging system before setting out could well be an advantage.

Plants, like fish in many ways, have standards set for them in some areas, but as a general rule should of course always be in the pink of condition with no torn, split or missing leaves. Rooted plants should also have good stock. There are even different rules governing the containers they may be shown in from area to area, with some insisting on tanks or jars and others allowing polythene bags.

The field of showing plants is one that has been greatly neglected by both aquarists and show organisers alike and I would therefore suggest your getting hold of a copy of the local standards and rules for showing plants to make sure yours measure up, then start lobbying for the class to be introduced at shows. You would get my support for a start.

And finally . . . Always remember that if you think you have a good fish or other exhibit, take it along to a show. It may not win, but at least you will have tried, and if you leave it in the tank at home it is not even going to have a chance.

Good showing!



## Coldwater Queries

by Arthur Boarder

**I have a pond with a number of goldfish which appear healthy and of both sexes, but they never spawn. Is there anything I can do to encourage them to do so?**

If the fishes have not spawned by the middle of May, remove at least a third of the water and exchange for cold fresh water. Run through a hose with a rose fitting so that the water enters the pond as from a fountain. This is better than a normal fountain as this just pumps the pond water up and this may be anything but pure. Change the quantity of water during an evening and the fishes should spawn the following morning. Repeat the process every week until you get results.

**My pond was frozen over for some days during the winter. Is there anything I should do now?**

Change most of the water. This is where the pond-keeper who has cleaned out his pond in late autumn, scores over one who hasn't. If there is the slightest amount of foul matter in a pond and it freezes over for a few days, there is a great danger of the water becoming foul and this would not have happened if the water had been changed and foul matter removed before the winter.

**I have a fantail which is continually chasing a Moor in the tank. Can they breed and if so what would the young be like? Also should they be separated afterwards and would they pair with other fishes? What size tank shall I need to breed them in?**

All varieties of goldfish can inter-breed. Any young ones could be of many shapes and colours. The parent fishes need not be separated but certainly from eggs or fry. It depends on how many fishes you wish to rear as to the number and sizes of tanks required. A tank, 24 in. x 12 in. x 12 in. will hold eighteen young fishes until they are an inch long overall.

**In one of my tanks I have lots of fish which include: Fantails, Moors, Orandas and Pearl-scales. I feed them well and they grow in length but I cannot get them to have fatter bodies. Why is this please?**

You did not state how large the tank is nor the numbers and sizes of the fishes. A lot of fishes need plenty of swimming space and if they do not get it they are not likely to thrive and develop properly. Also you must realise that some varieties of fancy goldfish have fatter

### READERS SERVICE

Our experts are always pleased to receive your letters which should be addressed to:  
**Readers Service, The Aquarist & Pond-keeper, The Butts, Brentford, Middlesex, TW8 8BN.**

All queries requiring a personal response must be accompanied by a stamped addressed envelope.

bodies than others and with any type of feeding you are not likely to get a fat body on a fish which does not usually have one. You must not exceed the stocking rate for the tank, which is an inch length of fish for each 24 square inches of surface area of water.

**I have a goldfish in a tank which often stands on its head for long periods. At other times it eats and appears to be normal. What is the matter with it?**

The fish appears to have something the matter with its swim bladder. This controls the position of the fish in the water and when anything goes wrong with it, the fish is unable to keep on an even keel. The trouble sometimes affects a fish as it ages or has something pressing on the bladder, such as a growth. It may be that the fish would improve in shallow water and slightly warmer than it is used to. On the other hand some such fishes gradually deteriorate and lie upside down on the bottom before losing strength and dying.

Goldfish with swimbladder trouble



**I have a pond, 10 ft. x 6 ft. x 2 ft. and am wondering if I could keep Koi, Orfe or types of goldfish?**

I suggest that you stock with Shubunkins, common goldfish or Fantails. Koi are unsuitable for your pond. During recent years there has become two distinct types of fish pond. Most successful Koi keepers favour a large pond with no plant life at all, constant filtration and in many cases warmth in the winter. The Koi pond then resembles a swimming pool, some with a large container on the side acting as a filter. The other type of garden pond is the attractive ornamental one and a pond the size of yours could be made attractive by having one water lily near the centre, a plant of Pickerel weed, *Pontederia cordata*, a plant with elongated, heart shaped leaves and blue flowers; a plant of *Sagittaria japonica*, with arrow shaped leaves and double white flowers. In another corner can be a flowering rush, such as *Butomus umbellatus*, which has an umbel of pink flowers. In another corner can be a clump of Water Crowfoot, *Ranunculus aquatilis*. A fine-leaved oxygenating plant which produces a mass of tiny white flowers just above the surface of the water. This will also serve as a spawning corner for the fishes. Such a pond will become very attractive and with careful pruning last for many years.

**I am intending to stock a medium sized pond with a variety of fancy goldfish with a view to breeding from them. Do you suggest one variety only in the pond and if so which one?**

If you wish to breed in the pond fancy goldfish it is essential to have only one variety in it. All varieties can interbreed and there are too many odd shaped fishes about already without adding to them deliberately. A very attractive variety is the Shubunkin and they will breed freely in your pond with little trouble. If you are subjected to severe frosts in winter, stock with London type instead of the Bristol, as the former are rather hardier. Try to start with fairly good, well coloured specimens so that the progeny may be of sufficient quality to enable you to make a bit of pocket money from them.

**I have two Weather fish, *Migurnis fossilis*, and recently one disappeared for two hours. Now one has been missing for two days and nights. Do you think that it has burrowed into the gravel?**

I do not think that the fish could live under the gravel for so long as it could be short of oxygen. I would be inclined to make a search through the gravel, as if the fish has died it will upset the water as it decays.

**I have a coldwater tank, 30 in. x 12 in. x 15 in., with various goldfishes. Can you recommend a suitable filter as there are so many on the market?**

As I have never used a filter in my years of fishkeeping, I cannot recommend a special filter. As you say there are so many on the market that I would not care to stick my neck out. I think that the wisest step you can take is to get in

touch with some of the members of your local Aquarist Society. Surely someone will have used one and can give you his practical experience. I do not see why you need a filter at all, unless you are over-stocking with fishes. The tank must not hold more than 12 inches of length of fish excluding the tail.

**I am thinking of setting up a coldwater tank. It will be quite a small one and I intend to keep Fantails, Veiltails, orandas, moors, shubunkins and comets. However is the comet more suitable for a pond than a tank?**

I do not know what you mean by quite a small tank. If it is to be smaller than a 24 in. x 12 in. x 12 in., it is not likely to hold more than 12 inches of length of fish, excluding the tail. You just cannot over-crowd fishes in a small tank and get away with it for long. The comet is certainly more suitable for a pond as it is a fast swimmer and needs plenty of space. As you wish to also breed fishes, I must emphasise that it would be impossible to do so in a small tank. Get my book, "Coldwater Fishkeeping" and learn a little more about the hobby before making an unsuitable start and so becoming disappointed.

**I am setting up a coldwater tank and would like your advice as to whether I should use some peat or soil in the base of the tank so that the water plants will grow well?**

If you are setting up a tank not less than 24 in. x 12 in. x 12 in. I suggest that you use some John Innes potting compost No. 1. Just over an inch in depth at the back running out as it reaches the front. Then cover with a good layer of washed river grit. Have it about an inch deep all over. Right at the front it is well to have little, if any base compost at all. This will make it easier for the weekly servicing, as mulm will be washed to the low front of the tank where it can be siphoned out easily. Water plants will grow all right after a time even if no growing medium is used. The droppings from the fishes will fertilise the plants but it may take a time before sufficient is available for a good growth.

**I have a rigid type plastic pond with some Koi, golden orfe, shubunkins and goldfish. Soon after I put them in, three orfe and two Koi died. What could have caused their deaths?**

It is not possible to state with any certainty from what the fishes died. However you did not state the size of the plastic pond. As the orfe soon died, I feel certain that the pond was lacking in oxygen. Orfe are usually the first fish to die when a pond lacks oxygen. They are fast swimmers and so must have a plentiful supply of oxygen. I surmise that the fish were found dead in the morning and had no signs on them of injury or disease. Koi and orfe are not suitable for a small pond. They may be all right for about a year if very small when introduced, but as they grow they would be in trouble.



## Plant Queries

by Vivian De Thabrew

I have a large community tank 3 ft. 4 in. long, 1 ft. 4½ in. wide and 1 ft. 9½ in. deep. The problem is that I can't seem to grow plants properly; they seem to grow for a few weeks but won't multiply, and eventually die off. I got the substrate from my local beach, from the mouth of a freshwater river which runs into the sea. It is about 1½ in. to 2 in. deep in the tank and is quite fine gravel. I have undergravel filters and use a 30 watt Grolux strip light, which is on from early morning till late at night.

I have tried most types of plants (Amazon Swords, Cabomba, *Elodea densa*, etc.) Please could you advise me about what to do and the best plants to use. Please could you tell me the capacity of my tank?

Unfortunately you do not indicate the water condition nor the temperature maintained in your tank. There are four important factors which govern good plant growth. They are:

1. Light
2. Water condition
3. Water temperature
4. Planting medium.

A correct combination of these four factors will give you good plant growth. As a general rule, most tropical aquatic plants available on the market need slightly acid and soft to slightly hard water. A temperature range of 72° to 78°F is satisfactory. The light requirement varies from species to species; but in general good light from above is necessary. However, you should not give too much strong light, as it will then encourage algae growth.

I hope when you collected the sand and gravel you washed them thoroughly before using in your tank. The depth of the planting medium should be about three inches deep. This will enable the plants to develop good roots. If you can put a thin layer of peat under the gravel, this will prove very beneficial for the plants. I do not think that you should give your plants so much light. In fact if you can cut down the period of lighting to say, 10 hours per day, this should be sufficient. Please also check the water pH to see whether it is slightly acid, that is, below 7.0. Maintain the temperature at around 74°-76°F.

There are many hardy plants suitable for your tank. Try some good, hardy plants like: *Aponogeton crispus*,

*A. undulatus*, *A. natans*, *Bacopa*, *Cryptocoryne beckettii*, *C. thwaitesii*, *C. griffithii*, *C. lutea*, *C. walkeri* (true species), *Echinodorus tenellus*, *E. martii*, *Hygrophila polysperma*, *Nymphoides indicum*, *Rotala*, *Limnophila sessiliflora*. All these are very undemanding species which once established grows well.

The approximate capacity of your tank is 39 gallons (178 litres).

I have a tropical fish tank which measures 18 in. × 12 in. × 15 in. high and I am having problems with my plants. Every time I buy a plant I find that after three weeks to a month they start to die. I have had my tank one year and have cleaned it out three times due to algae growth. The pH of the water is 7.0, and the temperature is 75°F. The tank gets 7 hours artificial light from a 30 watt bulb and natural light throughout the day. The pump is a "Whisper 2000", working 24 hours per day and controls and supplies air to a box filter and airstone. I have various types of fish and have tried to grow the following plants: *Cabomba*, *Cryptocoryne willisii*, *C. haertliana*, *Water Wisteria* and *Pygmy Chain Sword*.

First of all let me list the conditions favourable for most tropical aquatic plants:

1. Slightly acid to neutral and soft to slightly hard water; a pH of 6.5-7.0.
2. A temperature range of 72°-78°F.
3. Moderate to good light for periods of up to 10 hours a day by a 30 or 40 watt light. Natural light if available is very good.
4. A fairly good planting medium. The medium should contain some nutrient matter to develop the plants well.

From your information it appears that you are maintaining your tank at an adequate temperature level, and giving sufficient artificial lighting. If you can bring the water condition to slight acidity this should prove very beneficial to the plants. Now what is left to examine is your planting medium. If it consists of just gravel, then it is not sufficient. The tank bottom should have some nutrients either in the form of plant detritus or some other material like clay or peat.

If you have not used peat, then it would be a good idea to use some as a layer under your gravel medium. The peat should be soaked in a container for a day or two. Then the floating particles should be skimmed and the peat squeezed out using a piece of muslin. The resulting pulp should be spread as a thin layer under the gravel. Alternatively you can use clay balls or small lumps, preferably sun-dried, by using them under individual plants or clumps of plants. If your filtration is efficient, clouding of the water will not happen. If there is any clouding at all, this will be very short-lived.

Please experiment with your water condition and planting medium and see whether this will make a significant improvement to your plant growing.

# A HISTORY OF THE BAF 1951-1980

## Part 3

1976

MANY OF THE societies' stands were of the usual high standard. Some had used a rather formal type of design but several had shown exceptional skill in providing a spectacular display to interest the many non-aquarists who attended. The first prize went to Southport A.S. for a celebration cake, very well executed and which must have taken considerable work to complete. The second prize went to Thorne A.S., for a splendid replica of a fireplace. The third place was awarded to Osram A.S. for a tableau of a 'Pop Group,' complete with three performers and guitars.

The Champion of Champion class made an attractive display and the first prize went to Mr. & Mrs. K. Blades of Bassetlaw A.S. with a Pumpkinseed Sun Bass, (*Lepomis gibbosus*), a fish which looked like one would expect a healthy Sun fish to be. The second prize went to S. Wolstenholme of Heywood A.S. with a tropical, an *Aulonocara* Malawi Cichlid, and the third to a *Cichlasoma citrinellum*, owned by G. Bond, of Southport A.S.

There were the usual excellent tropicals on display and

it appeared that the Cichlids are becoming very popular nowadays.

The coldwater fishes were again of a good standard and some very fine common goldfish were to be seen. These fish are usually to the fore at Belle Vue. A fish which caught my eye was the winning Lionhead, one of the best specimens I have seen. There was a fine Bubble-eye with two of the best bubbles I have seen and a tank of Shubunkins in the breeders class was also eye-catching.

The Koi were not left out by any means. The British Koi Keepers Society had a fine pond, 21 feet by 7 feet with about sixty fine Koi showing many variations in colour. This exhibit attracted a lot of attention. There was also a fine display of Killifish by the Society where enthusiasts of this fish could view varied types.

There were over two dozen trade exhibits and their stands were besieged by hundreds of buyers for most of the time. At the commencement of this event, a very pleasing ceremony was performed by Mr. G. W. Cooke who presented Mr. J. Butler with a "Parker" silver pen and pencil, as a token of appreciation for all the work he has done over the years.



1977

FASCINATED BY THE varied array of filters, pumps, tanks, lighting systems, new and long-established aquarium plants, foods, sealants, books, sea shells and corals, bogwood, fishes and so on offered for sale by the dealers. (Incidentally, there were 26 trade stands at this year's show.) Still one of the best places to see many tropical and coldwater species that rarely come into the less-exalted suppliers' establishments. Mr. and Mrs. H. Gough, of Wynnstay A.S. took first prize in this Champion of Champions class with their *Pimelodus clarias*—a catfish unquestionably worthy of its award. It was in superlative condition and colour and measured about a foot in length. Second prize went to Mr. J. K. Alder, of Hartlepool A.S., for a splendidly proportioned *Mylossoma argenteum*. Mr. S. Wolstenholme, of Heywood and District A.S., took third prize with his vibrant blue *Aulonacara rostratus*, one of the scores of beautiful cichlids indigenous to the African Lake Malawi. A. Leer's gourami (*Trichogaster leerii*), owned by Mr. J. Tabberer (Merseyside A.S.), ran away with first prize for Best Fish of the Show.

There is no denying that the societies' tableaux get better every year. First prize this year went to Yorkshire

& District A.S. for a most magnificent model of York Minster. Second prize went to Midland Aquatic Study Group for an exhibit called twin hearts—a tableau distinguished by its originality and neatness of design. Castleford A.S. took third prize with its clever impression of a fairground bingo stall.

Most goldfish enthusiasts, I fancy, have come to expect the highest quality fish on the stand of Northern Goldfish and Pondkeepers Society. In this year's festival this society took first, second and third prizes in the breeders' class for shubunkins; the Challenge Trophy for Class 4 (common goldfish and comets); the Challenge Trophy for Class 5 (shubunkins, Bristol and London).

1978

THE CHAMPION OF CHAMPIONS stand attracted plenty of attention. A magnificent *Mylossoma argenteum*—a rounded-diamond-shaped fish from the Amazon—with canary-yellow to ochre-red fins and shining silver flanks, took first prize for its owner, Mr. J. K. Alder (Hartlepool A.S.). Second prize went to Mr. S. Wolstenholme (Heywood & District A.S.) for his *Aulonacara rostratus*. This cichlid from Lake Malawi, handsomely garbed in iridescent and muted shade of blue, was a perfect specimen

Below: Close-up of York Minster tableau showing workmanship in detail





Mr Arthur Boarder presenting cheque to Mr George Cooke in recognition of all his past services as organiser of the British Aquarists' Festival

of its kind. Another African species, popularly known as the upside-down catfish (*Symodotis nigricentris*), took a well-deserved third prize. It was exhibited by Mr. J. Nimmo, a member of Lanarkshire A.S. An exquisitely patterned *Fulidochromis marlieri*, owned by Mr. and Mrs. N. Bollen (York A.S.) was awarded first prize for Best Fish in the Show.

Competitive tableaux were as exciting as ever. The first prize at this year's exhibition was secured by Hyde A.S. for their cleverly designed and constructed pin-ball machine. Basingstoke A.S. was awarded third prize for a superbly constructed and finished Police Box.

Fourth prize was given to Ostram A.S. All in all, the societies' tableaux had plenty to offer in the way of imaginative lay-outs and well-known and little known fishes. The Northern Goldfish and Pondkeepers' Society romped away with plenty of awards. This society staged a most thrilling display of goldfish. The common goldfish that took a first prize was a beautifully proportioned specimen of glowing red-gold hue. The lionheads that took second prize were of excellent shape and pleasing colour. Some really lovely shubunkins, moors, comets and one particularly fine red-cap oranda graced this stand. Mr. Les Sunsbury, a Manchester member of the B.K.A., was awarded first prize for his pair of *Aphyosemon sjoestedti*. Interestingly, at the first BAF in 1951, Mr. Sunsbury took first prize in a class for loaches.

## 1979

THE FAMILIAR TABLEAUX were smaller than before, reflecting rocketing material costs although the one entered by Belle Vue Aquarist Society was built for an outlay of less than £2.00. In the main the accent was on subtlety rather than impressive technical detail and the first award winner Wrexham exemplifies this factor.

Bridgewater Aquarist Society's tableau (2nd prize) simulated an arched bridge spanning a stream and Macclesfield A.S. went for gaudy colour in their Pisces Discoteque with which they secured fourth prize.

The Champion of Champions was a large *Distachodus sexfasciatus* owned by Mr. R. Atherton of Hartlepool A.S. who also won second award for a *Pseudotropheus fuellborni*. Third prize went to Mr. A. Underwood of Sandgrounders A.S. for a jewel-like Texas Cichlid.

Best Fish in Show (coldwater) was a truly magnificent common goldfish owned by Mr. F. Seymour of Merseyside A.S.

The Northern Goldfish and Pondkeepers' Society delighted everyone with their usual splendid display of Shubunkins, Lionheads, Fantails, Moors, Rudd, etc., and carried off the first, second and third prizes in Class 10 (Shubunkins) and a First in Class 13 with a Lionhead which displayed its contented mien by remaining almost motionless and in suspension throughout the show.



Bury Aquarist Society collected a host of awards including five firsts, two seconds and five thirds. Halifax A.S. had a neat stand but its attractive feature lay in its tanks which won first award for Tropical Individual Furnished and first for Coldwater Individual Furnished which latter housed a trio of young fantails.

Fishkeepers A.S. displayed some nice marines winning

a second award for a *Paracantharus pleatus*. They also gained a first in Class 32b with a *Pseudonys script elegans* terrapin.

The Dealers' stands, too, contained some good fish and goldfish varieties and African cichlids abounded. Kalven Aquatics in particular, had some eye-jerking Clown Loaches of great size and splendid quality.

## CHAMPION OF CHAMPIONS

### Competition Results



**1st**  
**R. Atherton**  
*Distochodus sexfasciatus*  
 Hartlepool

**2nd**  
**R. Atherton**  
*Labeotropheus fülleborni*  
 Hartlepool

**3rd**  
**A. Underwood**  
*Texas Cichlid*  
 Sandgrounders

#### Results of other festival competitions

Tableaux: 1, Wrexham; 2, Bridgewater; 3, Oram; 4, Maclefield; 5, Belle Vue.  
 Society Furnished, Halifax. Independent Furnished: D. Shields (Halifax).  
 Best Fish, Common Goldfish: E. Seymour (Merseyside). Best Pair: Mr. and Mrs. B. Walsh (Darwen). Best Aquascaper: H. Haslam (Belle Vue). Best Novscape: E. Seymour (Merseyside). Best Breeders, highest pointed: K. Buckley (Bridgewater). Best Tropical: L. Gyves (Sandgrounders). Best Coldwater: E. Seymour (Merseyside). Tropical Farn. Society: 1, Halifax; 2, Northwich; 3, St. Helens. Coldwater Farn. Society: 1, Halifax; 2, Northwich; 3, NGPS. Tropical Farn. Individual: 1, D. Shields (Halifax); 2, L. Thorne (Northwich); 3, E. B. Trevis (Bury). Coldwater Farn. Individual: 1, D. Shields (Halifax); 2, A. Mills (Bury). Marine Farn.: 1, 2 and 3, C. Rose (Warrington). Aquascaper: 1, H. Haslam (Belle Vue); 2, L. Thorne (Northwich); 3, Mr. and Mrs. N. Stevenson (Oram). Novrty Aquascaper: 1 and 2, E. Seymour (Merseyside); 3, Mr. and Mrs. Stevenson (Oram). Plants: 1 and 2, D. Shields (Halifax); 3, E. Jones (Wrexham). Comn. Goldfish and Comets: 1, E. Seymour (Merseyside); 2, P. Hewitt (NGPS); 3, A. Buckley (Bury). Shubunkins: 1 and 2, R. Howard (NGPS); 3, P. Hewitt (NGPS). Moors: 1 and 2, P. D. Lane (NGPS). Veinails: 1, P. Hewitt (NGPS); 2, P. D. Lane (NGPS); 3, Miss Andrews (NGPS). Fancy and New Varieties: 1, D. Gordon and S. Stephenson (NGPS); 2, P. Hewitt (NGPS); 3, Gregory and Lord (NGPS). A.O.V. Coldwater: 1, J. Buckley (Northwich); 2 and 3, R. O'Connell (Oram). Coldwater Breeders, Single Tail: 1 and 2, P. D. Lane (NGPS); 3, L. Baxter (NGPS). Twin Tail: 1, F. Hodgkinson (NGPS); 2, D. Gordon and S. Stephenson (NGPS); 3, P. D. Lane (NGPS). Guppy: 1, J. Hutchings (F.G.A.); 2, T. Carver (Bridgewater); 3, Mr. and Mrs. Stevenson (Oram). Platy: 1, Mrs. I. Strange (Basingstoke); 2, A. Standing (Bury); 3, I. Brown (Stratford). Swords: 1 and 3, H. Murray (Hyde); 2, M. Strange (Basingstoke). A.O.V. Livebearer: 1, A. Standing (Bury); 2, M. Strange (Basingstoke); 3, Mr. and Mrs. Bentley (Oram). Guppy: 1, R. Wheatley (F.G.A.); 2, J. Lester (F.G.A.); 3, J. Hutchings (F.G.A.). Molly: 1, R. Barrow (Stratford); 2, Mr. and Mrs. R. Idon (Sandgrounders). Platy: 1, A. Standing (Bury); 2, K. Corbett (Merseyside); 3, A. Buckley (Bury). Swords: 1, Mr. and Mrs. Horrocks (Oram); 2, M. Strange (Basingstoke); 3, A. Standing (Bury). A.O.V. Livebearer: 1, A. Handler (Northwich); 2, Mrs. M. Hooley (Fishkeepers); 3, P. Murray (Basingstoke). Rift Valley and Lakes (S.): 1, T. Reid (Fishkeepers); 2, D. A. Whitehouse (Wolverhampton); 3, R. Payne (Merseyside). Rift Valley (P.): 1, J. B. Rowley (Bury). Dwarf Cichlid (S.): 1, D. Lacey (Fishkeepers); 2, Mr. and Mrs. Walker (Merseyside); 3, J. Corbett (Merseyside). Dwarf Cichlid (P.): 1, C. Heath (Northwich); 2, P. Swales (Halifax). Cichlid Large

(S.): 1, L. Gyves (Sandgrounders); 2, Mrs. B. Newell (Glossop); 3, J. Haley (Darwen). Cichlid Large (P.): 1, T. Cottrell (Hyde); 2, Mr. and Mrs. Orwood (Wrexham); 3, P. Swales (Halifax). Siamese Fighters A.V. (S.): 1, K. Corbett (Merseyside); 2, J. Buckley (Northwich); 3, D. Conroy (Darwen). Siamese Fighters A.V. (P.): 1, Mrs. H. Blades (Fishkeepers); 2, B. W. Carter (St. Helens). Gouramis and Paradise (S.): 1, Mr. and Mrs. F. Yates (Darwen); 2, M. Bugeyne (Bridgewater); 3, P. Swales (Halifax). Gouramis and Paradise (P.): 1, L. Bradley (Northwich); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, J. Shackleton (Halifax). Barbs (S.): 1, Mr. and Mrs. Brannon (Oram); 2, A. Mellor (Blackpool); 3, F. Kenyon (Sandgrounders). Barbs (P.): 1, Mrs. H. Blades (Fishkeepers); 2, Mr. and Mrs. Stevenson (Oram); 3, Mr. and Mrs. Goddard (Macclesfield). Chataina (S.): 1, A. Buckley (Bury); 2, R. Tomkinson (Glossop); 3, F. and S. Whitehouse (Wolverhampton). Chataina (P.): 1 and 2, Mr. and Mrs. B. Walsh (Darwen); 3, Mr. and Mrs. Mathers (Wrexham). Carps and Minnows: 1, W. Hamworth (Basingstoke); 2, Mr. and Mrs. P. Yates (Darwen); 3, R. Payne (Merseyside). Carps and Minnows: 1, Mr. and Mrs. Walker (Merseyside); 2, J. Haley (Darwen); 3, I. Brown (Stratford). Cats (S.): 1, F. and S. Whitehouse (Wolverhampton); 2, R. Tomkinson (Glossop); 3, R. Buckley (Fishkeepers). Cats (P.): 1, Mr. and Mrs. Brannon (Oram); 2, M. Bugeyne (Bridgewater); 3, R. O'Connell (Oram). Killies (S.): 1, K. Buckley (Bridgewater); 2, R. Scottock (B.K.A.); 3, A. Brown (B.K.A.). Killies (P.): 1 and 3, K. Buckley (Bridgewater); 2, H. Buckley (Fishkeepers). Loaches (S.): 1, Mr. and Mrs. Underwood (Sandgrounders); 2, Mr. and Mrs. Williams (Wrexham); 3, Mr. and Mrs. B. Walsh (Darwen). Loaches (P.): 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, W. D. Haddow (Hyde); 3, J. Shackleton (Halifax). Marins (S.): 1, C. Heath (Northwich); 2 and 3, Mr. and Mrs. Wainwright (Fishkeepers). A.O.V. (S.): 1, T. Reid (Fishkeepers); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, D. Kidd (Wolverhampton). A.O.V. (P.): 1, J. Haley (Darwen); 2, F. Oliver (Wrexham); 3, D. Kidd (Wolverhampton). Breeders (Egg): 11-15: 1, K. Buckley (Bridgewater); 2, M. Stronze (Basingstoke); 3, R. Scottock (B.K.A.). Breeders (Egg) 6-10: 1, K. Buckley (Bridgewater); 2, A. Mellor (Blackpool); 3, R. Payne (Merseyside). Breeders (Egg) 1-5: 1, R. Wilson (Sandgrounders); 2, S. Dunn (Runcorn); 3, E. B. Trevis (Bury). Breeders (Live) 11-20: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, K. Thompson (Merseyside); 3, P. Murray (Basingstoke). Breeders (Live) 1-10: 1, A. Buckley (Bury); 2, R. Blight (Basingstoke); 3, Mr. and Mrs. Goddard (Macclesfield). Amphibians: 1, Mrs. H. Blades (Fishkeepers); 2, A. Casey (Blackpool). Trophy for Exhibitor with Most Awards: P. D. Lane (NGPS). Show League: 1, Sandgrounders; 2, Merseyside; 3, St. Helens; 4, Oram; 5, Darwen.

THERE IS A GOBY belonging to Mr. and Mrs. Neville Stevenson of Oldham that is unaware of its place in the history books.

It became the first fish to be awarded best in show points at the British Aquarist Festival by a judge from the Federation of British Aquatic Societies.

Mr. G. Liddle of Newcastle-upon-Tyne joined Mr. Adrian Blake of Basingstoke as guest judges at the festival this year, and it was Mr. Liddle who gave the goby 84 points—much to Mr. and Mrs. Stevenson's delight!

It was the first time that F.B.A.S. judges had participated at the show and many people welcomed the move as it must surely help to draw the two federations closer together.

One result of the invitation to the F.B.A.S. was that Mr. Roy Johnson of the F.N.A.S. was a guest judge at the Alexandra Palace show in October.

Entries in the Champion of Champions contest, which is sponsored by *The Aquarist and Pondkeeper*, were well up on last year with entries from as far away as Grimsby, Basingstoke and Port Talbot.

In the end the winner was Mr. M. A. Hollingworth of Sherwood A.S. with a lovely example of *Haplochromis ocellatus*.

#### Society tableau

The winners were Sandgrounders of Southport. Their log cabin was well-made and well-finished and it was attention to detail which gave it the edge over the runners-up. Pocklington's 'Fish House'—a model house in the shape of a fish—came a worthy second, and the 'Television' shop built by St. Helens A.S. was third.

The trade stands at the show displayed plenty of equipment to please everyone, including some new imports from America and Germany.

Members of the Sandgrounders Aquarist Society of Southport gather proudly round the tableau that won first place at the British Aquarist Festival. Holding the trophy is show secretary Bernie Baldwin.



Mr M A Hollingworth of Sherwood AS collects his special gold pin, plaque and cheque for £40 from Mr John Young of "The Aquarist and Pondkeeper" after his cichlid had won first place in the Champion of Champions contest

Mr and Mrs Neville Stevenson of Oldham AS pose with their daughters to show off the Best in Show trophy and Best Tropical Fish trophy which they won at the BAF.





## from Aquarists' Societies

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.

### EAST



THE a.g.m. of Southern Livebearers Aquatic Group was held at Newbury on 21st November. Reports from officers indicated that there had been some turmoil during the last year, but decisions taken by the meeting showed that the membership was not interested in politics but in livebearing fishes. Many new species of livebearing fish have been introduced to the hobby in the last few years since S.L.A.G. was formed. Officers elected were Chairman, Mervyn Strang; Secretary, Nobby Noble; treasurer, Colin Howe; Special Control Officer, Mike Clarke; P.R.O. Overseas, Ivan Dibble; P.R.O. UK, John Corbett; Journal Editor, Bernard Meach; Committee members, Don Greenwood and Colin Taylor. Details of membership from P.R.O. UK, John Corbett, 28 Durban Road, Liverpool L11 5KY. (Tel: 051-2202240) or the Secretary, Nobby Noble, 58 Woodville Road, Boston, Lincs. PE21 8AP. (Tel: 0205-56418.)

### SOUTH EAST



THE Sudbury A.S. held their biennial general meeting on 14th October. The members of the committee are now as follows: chairman, A. P. Taylor; secretary, John C. Mann, 58 Barners Lane, Harrow, Middlesex HA2 6JQ. Tel: 01-864 6095; show secretary, Barry Witteridge; treasurer, Laurie Brazier. The Society continues to meet every Wednesday at 8 p.m. at St. John's Church Hall in Crawford Avenue, Wembley; and visitors and new members are always welcome. The programme consists of talks, quizzes, table shows, bring-and-buys and inter-club meetings and should be of interest to newcomers and old hands alike.

THE East London Aquarist and Pondkeepers Association held their 32nd annual open Breeders Show at the Cathedral Hall, Cool Road, Chesham

Heath, Essex. This was the first show of their new address and they would like to thank all those who contributed to making it a success. Results: Class AG: 1, R. Campion (ELAPA); 2, T. Walter (Southend); 3, K. Wingham (ELAPA); 4, D. Seman (Ilford). Class ZA: 1, C. Cherrington (Southend); 2, G. Smith (Walthamstow); 3, C. Cherrington; 4, Mrs. E. Boss (ELAPA). Class ZBC: 1, K. Wingham; 2, F. Simmons (ELAPA); 3, K. Palmer (ELAPA); 4, Martin Howells. Class XS: 1, 2 and 3, R. Campion; 4, D. Ridgwell (Southend). Class XC: 1, Mrs. E. Boss; 2, F. Simmons (ELAPA); 3, R. Campion; 4, F. Simmons. Class XDB: 1 and 2, R. Thoday (Braintree); 3 and 4, R. Campion. Class XDC: 1, B. Light (East Dulwich); 2, R. Thoday. Class XDI: 1 and 4, D. Ridgwell (Southend); 2 and 3, Mrs. D. Theobald (ENAS). Class XF: 1, 2, 3 and 4, B. Farrow (Southend). Class XGHLM: 1, Mrs. D. Theobald; 2, R. Roth (Ilford); 3 and 4, R. Campion. Class XJK: 1 and 4, B. Campion; 2, F. Simmons; 3, G. Smith (ELAPA). Class XOPB: 1, B. Meach (Braintree); 2 and 3, G. Smith; 4, A. Waller (ELAPA). Class XT: 1, B. Meach (Braintree); 2, B. Hastings (SE London); 3, D. Cherrington; 4, R. Campion. Class XUVW: 1 and 4, Mrs. S. Brown; 2 and 3, D. Mills (ELAPA). Class NY: 1 and 4, A. Dunsany (Harringay); 2, R. Campion; 3, J. Boss (ELAPA). Class NC: 1, B. Light (East Dulwich); 2 and 3, R. Campion; 4, J. Boss. Class NF: 1, C. Cherrington; 2 and 4, B. Farrow (Southend); 3, R. Thoday. Class NH: 1 and 4, T. Walmesley; 2, Mrs. D. Theobald; 3, B. Light. Class NOT: 1 and 4, D. Cherrington; 2, B. Hastings (SE London); 3, B. Light.

ON Tuesday 15th December South Park Aquatic (study) Society held a Christmas open night. This was a social evening without the usual lectures and talks, allowing aquarists to discuss fishkeeping in a very relaxed atmosphere. Topics of conversation included the quality of recently imported fish, the S.P.A.S.S. Globe-eye project, next year's open show, and which member was going to breed the perfect Goldfish in 1982. Full details of S.P.A.S.S. are available from Mrs. Margarita Dudley, 183 South Park Road, Waindalen, London SW19 4RX. (Tel: 01-540 5662). The society specialises in coldwater fishkeeping and meets at 8.00 p.m. on the third Tuesday of every month at the Waindalen Community Centre, St. George's Road, London SW19. New members and visitors always welcome.

WINNER of this year's annual quiz, held at the December meeting of the East Kent Aquatic Study Group was David Jane. He correctly answered thirty-one of the fifty questions. The quiz was directed by last year's winner, John Gilbert, his questions spanned many aspects of the fishkeepers hobby. Also taking place that evening was the Annual Breeders' Competition. This entailed entering four young fish, bred by the exhibitor. There were sixteen entries in these classes. They were judged by Joan and Colin Pansell. Results: Egg-layers: 1, B. Meach; 2, R. Matthews; 3, R. Spoor; 4, L. Spoor. Livebearers: 1, A. Aspinall; 2, R. Matthews; 3, P. Savary; 4, C. J. Bridgeman. Coldwaters: 1, R. Matthews; 2, F. Smith. Also in December was the Christmas Social. This was held at the "Snauggates Inn", Herne, on Thursday 10th. Despite the freezing fog on that evening, over fifty members and guests attended. Entertainment was supplied by the excellent disco of society member Paul Saxby, and the evening was much enjoyed by all. Information about the society is available from the P.R.O., R. Spoor, 23 Godden Road, Canterbury, Kent.

THE Brighton and Southern A.S. 1982 open show will be held on the 6th June at St. Barnabas Church Hall, Sackville Road, Hove. It is hoped that the show will be an even greater extravaganza

than past years. Further details will be advised shortly. A programme of speakers and events is being prepared for 1982 and it is hoped to arrange a wide selection of talks on the many aspects of the hobby. New members are always welcome. Meetings are held on the first and third Mondays of each month at the Foredown School, Manor Road, Perolade. For further details please contact Mrs. E. Smith, 3 Woodmill Copse, Durrington.

AT the a.g.m. of Hendon and District A.S. a new committee was elected to office for 1982. Chairman, Mr. R. Mould; Treasurer, Mr. B. Casey; Secretary, Mr. D. Allison, 88 Olton Road, New Southgate, London N11 and two committee members, Mr. T. Glass and Mr. R. Johnson. The Society meets on the 2nd and 4th Thursday of each month at The Henry Burden Hall, The Barrington, Hendon, NW4 at 8 p.m., where new members will be most welcome.

### NORTH



AT the a.g.m. of Whitley & District A.S. the new secretary elected was Mr. G. Taylor, 28 Ruswick Avenue, Whitley, North Yorkshire. (Tel: Whitley 604465.)

AT the a.g.m. of Oldham & District A.S. the officers elected were: Chairman, Mr. R. Colley; vice-chairman, Mr. N. Stevenson; treasurer, Mr. E. Birchwood; secretary, Mrs. B. Colley, 11 Chatterworth Street, Oldham; show secretary, Mr. A. Chadwick, 8 Beccoville Close, Chadderton, Oldham OL1 2RH; Fund raising officer, Mr. K. O. Rourke; libraries, Mr. D. Hale; public relation officers, Mr. E. Coope and Mr. R. Scotland. Due to an enforced change of venue and evening Mrs. E. Brown, the club treasurer for the past 30 years, had to resign. She was presented with a set of cut-glass drinking glasses as a gesture of thanks for her years of loyal service. Although membership does not grow, enthusiasm does. New members, old members, and visitors to the club are always welcome. Meetings are held on alternate Tuesday evenings at 8.00 p.m. at the "Angel Hotel", Shaw Road, Royton. Further details from Mrs. Barbara Colley (Tel: 061-620 7607).

THE Cannock & District A.S. has had a wonderful fishkeeping year, and would like to thank all of the speakers, judges and enthusiasts who have helped make it so. The awards for 1981, will be presented at a special evening on a Saturday at the end of February. Award winners are: Miniature Aquaria: Senior, A. and R. Potts; Junior, Miss R. Hall. Home Aquaria: Senior, A. and R. Potts; Junior, B. Hall. Champion of Champions: M. Kirkham. Aggregate Senior, 1st, A. and R. Potts; 2nd, M. Kirkham; 3rd, J. Shaw. Junior, 1, B. Hall; 2, Miss R. Hall. Breeders Class: M. Kirkham. Fish Rearing: Mr. and Mrs. F. Smith. Fish over 6 ins., H. Evans. Pair Class: J. Shaw. A.O.V. Catfish: H. Evans. Plant Trophy: A. and R. Potts. The society meets each first and third Tuesday every month at the Progressive Working Men's Club, Market Hall Street, Cannock, at 8.30 p.m. Several activities have already been organized for the coming year.

and more information will be gladly given from Robert Potts, Secretary, 25 Oaks Drive, Cannock, Staffordshire WS11 1EU. Visitors and new members are very welcome to attend.

## MIDLANDS AND WALES



Aberdare A.S. highlights of past year were: Knockout Shield won by Mr. R. Roberts; Catfish

Trophy, Master A. Samson; Labyrinth Shield, Mr. S. Rees (for the second year). One of the best slide lectures was given by Mr. G. Mellish of Zambesi Tropicals, about his visit to Lake Malawi—catching and collecting fish. Mr. Mellish gave an extremely interesting lecture and showed some excellent slides.

THE December meeting of the Gloucester A.S. took the form of a Slide Show and prize giving for the Society's "Home Aquarium Competition" which had been held in November. Results were as follows: Senior Section: 1, P. W. Frost, 296 pts; 2, R. Young and T. Tapping equal placings with 291; 4, T. Tapping, 286. Junior Section: 1, J. Williams, 356 pts; 2, A. Frost, 286; 3, N. Frost, 285; 4, C. Washon and C. Sperry equal placings with 264.

A total of 22 aquaria were judged by Mr. N. Binding and Mr. M. Jenkins of Cheltenham Tropical Fish Club and Mr. and Mrs. Anderson of Longdons Aquaria. The Society members were shown slides taken of all the aquaria entered into the competition. The Chairman particularly praised the winner of the Junior Section who also gained the highest points overall. The results of the December Table Show for Barbies was as follows: 1, T. Tapping, Cuminga barb (female); 2, C. Sperry, Albino Tiger barb; 3, P. W. Frost, Tindal barb; 4, T. Tapping, Cuminga barb (male). Meetings of the Society are held on the first Tuesday of each month at the Chappens Bridge Centre, Paternock Road, Gloucester.

## SCOTLAND



AT the December meeting of the Paisley & District A.S. the guest speaker was Mr. J. Milligan, from Edinburgh. The table show was Tropical Minnows, Rasbora's and Danios. Results: Senior League: 1, Scissors, D. Rytherford; 2, Zebra Danio, J. Thompson; 3, Rasbora, S. Hamilton; 4, Zebra Danio, J. Thompson. Junior League: 1 and 2, Zebra Danio, R. Brooking; 3, Zebra Danio, D. Lafferty; 4, Zebra Danio, D. Rogan. Meetings are held on the first Tuesday of every month.

# Dates for the diary

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

## FEBRUARY

13th February: Southern Livebearers Aquatic Group, Yorkshire Area Group, meeting at 3 p.m., at Thorne Town Council Assembly Rooms, Thorne, Nr. Doncaster. Speaker: John Scarril on "Commercial breeding of livebearing fishes." Table Show: Guppies and Gambusia. Further details from Group Secretary, Naisy Noble, 58 Woodville Road, Boston, Lincs. PE21 8AP. (Tel: 0205-50438).

16th February: Sheaf Valley A.S. open show at the Dormer Twist Drill. For further information phone Mr. D. Golland (Sheffield 746046).

26th February: Central Midlands Cichlid Group. Meeting at 8 p.m. Further details from Mrs. Maureen Hall, 71 Saxon Road, Penkridge, Staffs. (Tel: 078-571 3944).

## MARCH

7th March: Keighly Aquarist Society open show at Victoria Hall, Keighly. Benching 12-20 p.m. Schedules from Mrs. P. Robinson, 2 Hope Hill View, Cottingly, Bingley, Yorks.

27th March: Croydon A.S. open show at the Ashburton High School, Shirley Road, Croydon.

## APRIL

4th April: Taunton & District A.S. open show at the Youth and Community Centre, Tangier, Taunton. Schedules available from R. Cooper, 14 Rochester Road, Taunton TA2 7LD.

4th April: Gateshead Foresters A.S. open show. Secretary: K. Crow, 79 Rodley Avenue, Gateshead, Tyne & Wear NE8 4JY.

17th April: Hendon Convention, speaker F. F. Schmidt from Holland, on "Habitat to Aquaria," to be held at Aylward Lower School, Windmill Road, Edmonton, London N18. Tickets available from Mr. D. Allison, 88 Olerton Road, New Southgate, London N11.

25th April: Merseyside Aquarist Society annual open show at the Rainhill Village Hall, Rainhill, Lancashire.

25th April: Workington & District A.S. annual open show.

25th April: Skigness and District A.S. 5th open show, Imperial Cafe, North Parade (opposite Pier), Skigness. Benching 12-2 p.m. Judging, 2.15 p.m. Bring and buy auction of fish and equipment (15% to Society). Entrance fee 15p. Refreshments, side stalls, raffle, etc.

## MAY

8th May: Bournemouth A.S. annual open show at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Show schedules available from 1st April from Show Secretary, Jack Jeffery, 30 Bramar Avenue, Bournemouth, Dorset BH16 4JF. S.A.S. please.

15th May: Southern Livebearers Aquatic Group, Yorkshire Area Group, meeting at 3 p.m., at Thorne Town Council Assembly Rooms, Thorne, Nr. Doncaster. Speaker: John Dawes, President of S.L.A.G. and Senior Advisory to Aquarian Foods. Table Show: Poecilia and Xiphophorus. Further details from Group Secretary, Naisy Noble, 58 Woodville Road, Boston, Lincs. PE21 8AP. (Tel: 0205-50438).

26th May: North Avon A.S. third open show. The venue for the show will be decided upon at a later date.

## JUNE

19th June: Nailsea & District A.S. ninth open show to be held at Clevedon Community Centre. For further details contact P. Fitchett, 2 Woodland Road, Nailsea, Bristol (Tel: Nailsea 853096).

## AUGUST

7th August: Northern Goldfish and Pondkeepers Society 6th open show at the Sports Centre, Silverwell Street, Bolton, Greater Manchester. Open to the public from 1 p.m. Details and entry forms from D. W. Lord, 40 Hospital Road, Bromley Cross, Bolton, Greater Manchester. (Tel: 0204 58190).

7th August: Bristol Tropical Fish Club open show at W. D. & H. O. Wills Recreation Hall, New Charlotte Street, Bodminster, Bristol. Benching 9.00 a.m./12.00 (noon). Schedules will be available from mid-June from the Show Secretary, Mr. I. Littleton, 9 Little Stoke Road, Stoke Bishop, Bristol BS9 1HQ. S.A.S. with application please. Show will be to F.R.A.S. rules and incorporate Aquarist Gold Pin, Championship Trophy class and Brooch scheme.