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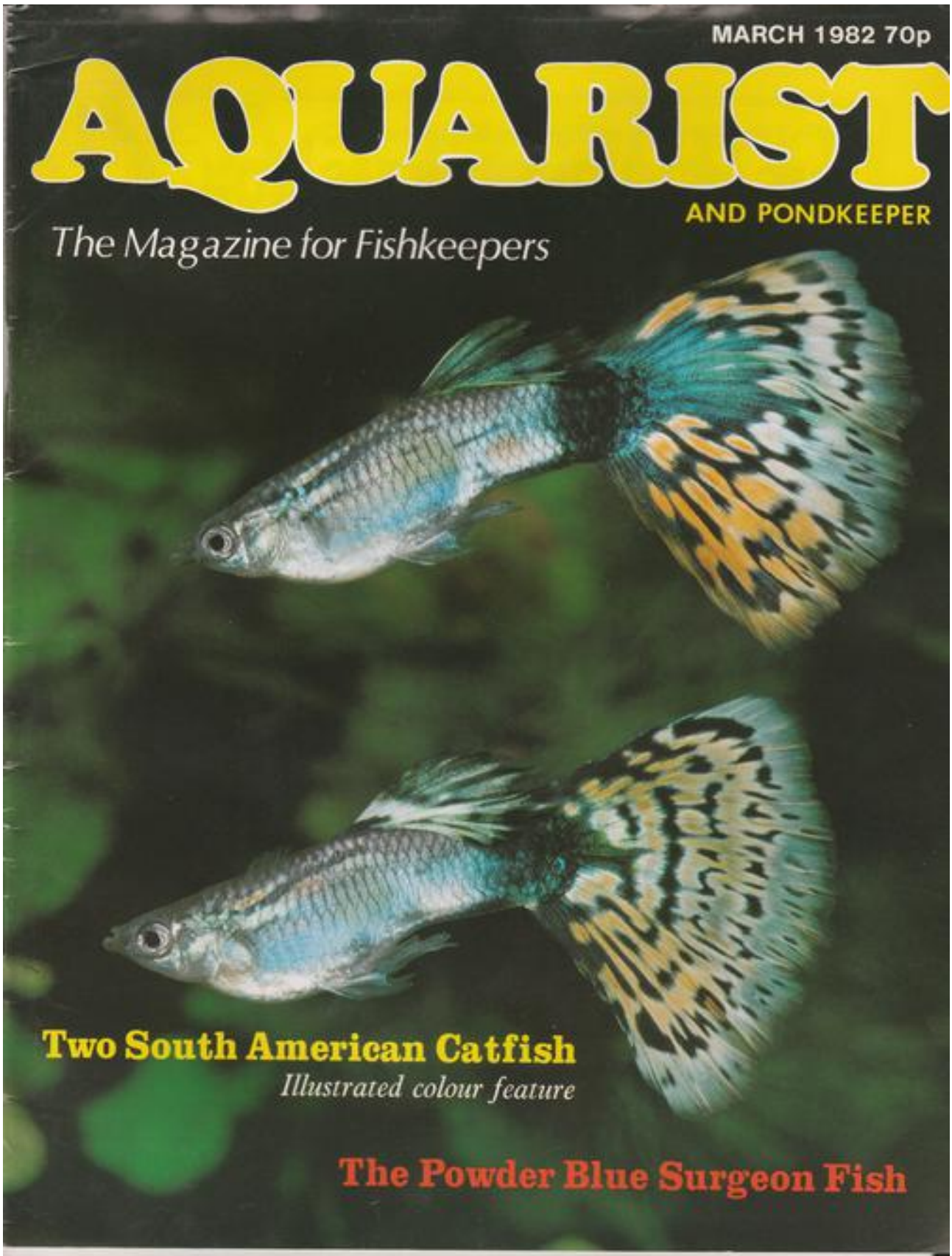
AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



Two South American Catfish

Illustrated colour feature

The Powder Blue Surgeon Fish

THE AQUARIST AND PONDKEEPER

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Poecilia reticulata (Guppies)
Photo by
A. van den Nieuwenhuizen

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Dwarf Gourami *(Blue variety)*

***Colisa lalia* pair, male above**

Reflections upon *Colisa lalia* by Arend van den Nieuwenhuizen, with photographs by the author

WHEN I was in Singapore two years ago and our good friend Yeok Ong took us to a breeder who had large numbers of not only mollies but also *Colisa lalia*, my thoughts returned to the year 1951. For this small labyrinth fish is a long-standing favourite of mine and I feel I could write an ode to this creature, all the more so because it is one of our most attractive aquarium fish. I took up fish-keeping again in 1950. The first phase came to an end in 1938, when I had to go to secondary school

and my mother said that was the end as far as my ten fish tanks and sixty pigeons were concerned. Then work came before animals and then came the war and then military service and then once again . . . fish.

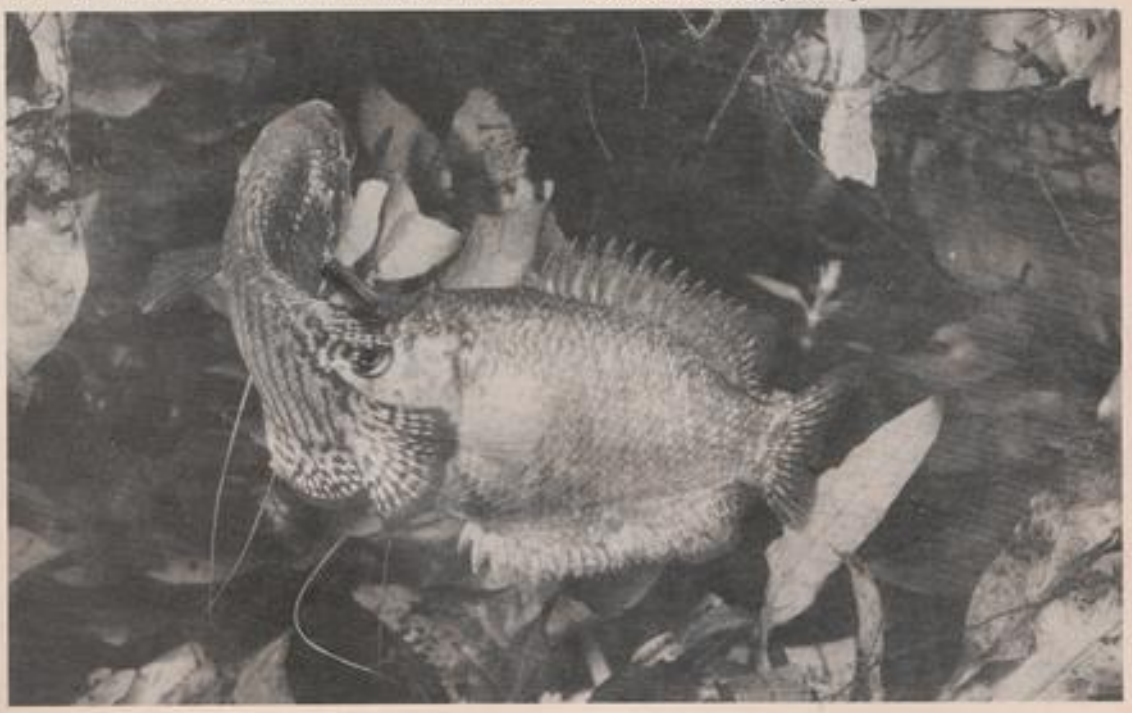
So in 1951 the total number of tanks in the house was eight. A metre tank in the bedroom containing *Ephippicharax orbicularis* and later *Apistogramma* (now *Papiliochromis*) *ramirezi;* a metre tank in the kitchen containing *Astronotus ocellatus,* another in the hall and others all over the living room, including a tank measuring 70 × 25 × 25 cm on a low table more or less below a south-facing window so that it got quite a lot of sunlight during the daytime. It contained ordinary Amsterdam tap water, it was planted with *Myriophyllum* and lying here and there were largish pieces of peat on a layer of very fine particles of peat. In addition, specimens of *Cryptocoryne nevillii.* At a temperature of 23 to 24°C the aquarium housed two indescribably beautiful male specimens of *Colisa lalia* together with three females. At the time they were unusual in being a good 5 cm when fully grown, which was bigger than was seen for a long time, but which are equalled today by imports from Singapore and Jakarta which one can obtain.

My resplendent specimens had an abundance of food. A park in the vicinity was full of ducks and water-fleas. I obtained white mosquito larvae from a ditch by a graveyard, travelling on my bike, half an hour there and half an hour back. So the fish were almost constantly in breeding condition and the males always ready to defend their territories. They usually fought towards the centre of the tank, threatening each other and occasionally delivering a hefty bump without really hurting each other. After the contest each of them withdrew to his own half of the tank. The females were able to move freely throughout the tank, as long as the males were not 'over sexed'. If the males had, in fact, designs upon a new marriage, the females had little freedom and positioned themselves somewhere in the middle of the tank amongst the plants.

At such times the males became busy in building bubble-nests. These were not loose constructions such as are often produced by *Macropodus* species, for example, when they build in the open at the water's surface, but a fixed and sturdy home for the eggs which are stored there. The fish plucked at and detached small leaves of *Myriophyllum* which were turning brown from their stems. Small pieces of fine aquatic moss and even pieces of peat were also used.

The females were not particularly intimidated and occasionally tried to approach the construction work, but were immediately driven away. An interesting point was the fact that the males almost always built nests at the same time. They were encouraged to do so by my introducing fresh water from time to time and raising the temperature a little. It was also evident that the fish built their nests as

Commencement of spawning



The embrace

far from the other as possible, positioning them as a rule in the clumps of *Myriophyllum* growing at the surface of the water.

Often the nests were completed at the same time and the females, which were well aware of the fact, began to make up to the males. It is not the case that the male labyrinth fish alone take the lead in their sex lives. In this respect they were modern in outlook much earlier than we humans. *Colisa lalia* females were already emancipated when we did not even know the word. What happens? The female swims up to the male. At first the latter is not very enthusiastic about the fact that the recently completed house is being approached by a member of the opposite sex. He drives the female away several times, therefore, and then discovers this is of no avail and suspends his resistance. The female presses on and nudges and caresses the male along his sides a few times. At first, he does not respond, the second time he puts on a display, then their love play is terminated and the next time they come together he entices the female to the nest in earnest and the fish embrace each other. The fish begin pairing,

at first only in pretence, but before long the eggs appear. But then it turns out that the term monogamous must be forgotten as far as these fish are concerned. For a second female often waits by the nest and awaits her chance to seduce the male in her turn. The female of the previous pairing usually does not hang around but swims straight across the tank to another lover and, lo and behold, the eggs fly about over there as well. The males then become very busy with gathering the eggs and storing them zealously in the nest. In this way the free and mixed marriage produces a large number of future offspring. If one is aware that 400-500 eggs per female is not a rarity, then one must consider in advance what one is undertaking, for if one wants to rear all the hatched young, it is advisable to take a few days holiday from the office and use the time to obtain pond *infusoria*. If *infusoria* are not to hand . . . then one really does need a lot of time at one's disposal. If rearing the fish does not appeal, but one is interested in seeing the spectacle of the spawning, then there is nothing to be lost and much pleasure to be had in watching the fish.

After the wedding festivities are over the females must 'take their leave' again and the males busy themselves in dismantling the nest, which by this time is often 8cm in width and almost 3 cm above the surface of the water. Given the opportunity they will also build among vegetation, thus creating a construction of plants held together by foam. Normally, one can in a short time, by viewing from above, see the development of the embryos, as the eggs get darker resulting from the pigmentation of the embryos. After two to four days (dependent on the temperature) the young hang beneath the nest, still bearing their yolk-sacs. After four to six days they are then free-swimming. In order to rear the young properly I always used to remove the nest from the tank while the young fish were still hanging from the underside.

In relation to rearing the fish, it is often discussed in reference books whether specimens, both young and old, should be kept under a high or a low level of water. I have always kept *Colisa* specimens at a maximum water level of 25-35 cm. But in the cases where friends had them in one metre tanks with a depth of 50 cm one could not say that the fish were adversely affected. One thing that could be observed was that the males, above all, established their territories in the upper water layer and only went to the bottom on occasions during feeding. I kept my *lalia* specimens at temperatures of 20-22°C and 25-28°C. The fish which were kept at higher temperatures did not live as long. That does not mean that they had short lives, but that the specimens which were kept at slightly lower temperatures generally had a longer lifespan. This is especially true of the blue variety, which first came from the famous breeder, Tan Guk Eng in Singapore.

Normally, I am no defender of high temperatures in the care of labyrinth fishes, although they do occur in the natural state. But nature and the aquarium are not the same thing. It is obvious that there are labyrinth fish which need high temperatures, such as the chocolate gourami, but the temperature in my tanks lies between 20 and 22°C or 22 and 26°C, depending on the species. The tanks I have containing labyrinth fish are covered at the top by a sheet of glass, but the air temperature is always the same as the overall (heated) room temperature in which the aquaria are housed. In the case of tanks which have a lip running along the inside of the tank sides I have removed it at the top of the tank front, so that a long gap is created which allows the air to enter freely. As a result there is never a big difference between the air temperature directly above the surface of the water and the room temperature when the glass cover is removed. However, this only applies to tanks up to 50 × 30 × 30 cm. Otherwise there is only a slight difference between air and water temperature.

In tropical regions this is usually the case, except the temperatures there are on a higher level. Certainly in the case of waters containing labyrinth fishes, where the water temperature never lies below 25°C in my experience. I have not measured temperatures in the highlands and mountain regions of Malaysia where we found the mouth-brooding *Betta* species.

Rearing young *lalia* specimens is not difficult once one has successfully got through the first few days, provided one takes the precaution of feeding them with freshly hatched brine shrimps and one maintains healthy water conditions. Above else a regular changing of a proportion of water is important during the first few weeks, whereby the same water temperature must be maintained.

The natural biotope of *Colisa lalia* I have, unfortunately, never seen, but it is probably reflected in the living conditions of the breeding stations of Singapore from which not only our 'usual' *Colisa lalia* fish but also the blue variety and an orange and an orange-red variety originate. My meeting with the latter in 1978 reawakened old memories and my enthusiasm was once again fired by their beauty and their splendid colours which flashed and sparkled in front of me in Singapore. So it transpired that our friend Ong had not been exaggerating when he promised to show us something special.

(to be continued)

Beginning with Tropicals (15)

by Roy Pinks

In discussing suitable beginners' fish I have so far assumed that mixed collections will be more usual than tanks dedicated to single or related species. The more experienced aquarist soon catches on to the fact that the latter will often prove to be more trouble-free than the so-called "community tanks". This is due to the fact that many of the species we include in mixed collections require specialized conditions if they are to do really well, and with a few notable exceptions, they are not noted for longevity. So, if you are aiming for maximum survival at minimum cost you have a choice of specializing in some of the better "community" performers, or in adopting some of the species which either get edged out of such collections by more attractive fish, or which are positively excluded because they are temperamentally unsociable in some way.

I will leave those in the last category—the loners—for more detailed examination. They are largely cichlids, many of which are very easy to keep, and which will fascinate the newcomer to the hobby if only he knows how to get the best from them. I will therefore confine these notes to species which I have found longest lasting in the face of less than optimum conditions.

Survivors

One of the supreme tests of survivability is the squalid environment, the onset of disease and the subsequent medication. A fish which can cope with this must attract a multi-star rating. The species which I have found consistently to withstand this sort of stress is the Cardinal Tetra, and because it has almost everything as an aquarium fish it is a wonder to me why more beginners just don't fill their tanks with these and let Nature take its course. The Platinum Tetra, already recorded as a good contrast fish with the Cardinal, has also performed very well in this test. Rosy Tetras and their close relatives have done rather less well, but still rank high overall. The Black Neon qualifies, too, as a generally robust species, and I have found that Emperor Tetras, once adult, come through pretty well on the whole. I would hate to generalize too positively, though. The batches of fish from which one secures specimens for trial vary quite considerably, and the best policy is to confine your purchases to those which are quite clearly in top condition.

The other category of reliable survivors—the community near misses—includes some slightly eccentric species. The Kuhli Loach (*Acanthophthalmus semicinctus*) may, perhaps, be rated as the most indestructible of aquarium species—at least I have found it so—and its orange/pink and dark brown barring makes it an attractive creature. It is eel-like, however, growing to about 4 in., and some folk simply cannot abide anything which suggests snakes, so this is more a victim of prejudice than most. Certainly, it is not much in evidence for much of the day, so needs some showy companionship to complement it. But it is a very worthwhile fish, being one of the genuine scavengers: it pokes and prods around the base of the tank quite ceaselessly and rapidly disposes of surplus food and dead inmates alike. Although Catfish are often recommended as members of the community tank they tend to miss out because of their comparatively high price, their quiet coloration and their somewhat strange appearance. Bottom dwellers, apart from the rarely available Dwarf Catfish, which swims in mid water, they are best cast in a supporting role, but it will be found that long after the showier performers have passed on their way, the Corydoras and relations will still be very much in business. This is one of the nice surprises one sometimes gets in fishkeeping—a favourite fish, long since mourned sometimes turns up again, having gone to ground for some reason. A 10 year life span for this group is by no means uncommon.

Botias, which resemble the Catfish in many ways, are much more showy, notably the Clown Loach (*B macracantha*), with its brilliant orange body, barred with black. They appear in mid water much more often than the Corydoras, and generally live longer than most aquarium fish. The Clown, certainly, has its own difficulties when young, and is best avoided by the beginner, but the other botias are not difficult in any way. Alkaline to neutral conditions with temperatures in the low 70's suit these fish very well, and they are suitable subjects to experiment with in terms of temperature reduction if you have an enquiring turn of mind. Feeding is no snag, either, as both dried and live foods are taken willingly. In general these fish are rarely attacked by disease, but if they do get into trouble, consult a reliable source as regards medication, preferably one with a money back guarantee, as these are more susceptible to drugs than to infections.

The beginner is always just dying to include Angels in his first collection, and I consistently advise against this. However, if you have taken advice on the lines of this article, here is a splendid chance to acquire some, as they and the Corydoras and the Botias mix very well as companions. The general conditions required by the one suit the others, and the visual impact of the Angels is just the sort of thing which brings the Cats into their own. The aquarist who sets up a collection like this will have invested well, as none of the fish are finicky or demanding, they will provide lots of varied interest, and they will all improve immensely as they grow. The Angels (the type, not the stringy or fanciful derivatives) are particularly rewarding when nearing adulthood, exhibiting colours never seen when they were smaller.

Lobelia cardinalis cultivated as a submerse plant

Lobelia cardinalis

An aquarium plant with regal flowers

by Karel Rataj

Illustrated by R. Zukal

THE GENUS Lobelia previously belonged, along with other genera, to the family Campanulacae. Today the independent family Lobeliceae includes about 20 genera with about 600 species. The genus Lobelia, which has about 250 species, is distributed mainly in the temperate to the tropical zone of the world. These species are absent from central and eastern Europe. The species which are grown in the aquarium are not imported by commercial suppliers—they are found, therefore, mainly in the tanks of American aquarists. The plants concerned are, in fact, species which, in the main, are found from Mexico up to the temperate region of the USA.

Two American species of this genus are typical water plants. They are *Lobelia dortmana* L. with narrow leaves growing from the substrate and *Lobelia paludosa* Nutt. with leaves which are alternate on the stems. Both species are probably quite rare and, as far as I know, are not kept by European aquarists. They have blue flowers, like most species of this genus.

Only two species of the genus Lobelia have scarlet flowers and both can be cultivated successfully under water. They are *Lobelia splendens* Willd. from Mexico and *L. cardinalis* L. from the USA. The first of them is cultivated very rarely over here, has rather small flowers, narrow leaves and is interesting in that in many of its life forms in the aquarium it forms a decorative rosette of

relatively large leaves emerging from 1m long stems.

Lobelia cardinalis comes from the area covering the state of New Brunswick to Florida (Ontario, Kansas, Colorado, Texas). In the natural state it is found on the damp ground of marshland, in roadside ditches, drainage channels and on the banks of still and flowing waterways, where the plant is often subject to being covered with rising water. It can adapt very well to extreme conditions, however and, providing it is watered regularly and sufficiently, it can be kept without difficulty in the garden for the sake of its decorative red flowers. It is usually set out in the garden at the end of May when it will reach a height of about 50 cm and flower regularly and profusely in August.

The stems of emerse plants are usually hairless and smooth, occasionally frail and bearing unobtrusive hairs. The leaves are alternate, elliptical to lanceolate, quite fine and like the stems in being completely smooth or lightly adorned with hairs. In general, it can be said that the smooth forms are better suited for adapting themselves to a submerged existence. The leaves are 3-9 cm long and 1·5-2·3 cm wide, almost equally narrowed at both ends, often almost pointed, and markedly serrated along the edges. The upper leaves are set directly on the stem, the lower ones have short petioles. The inflorescence is clustered. The corollae of the flowers are scarlet, crimson or red, 1·5-2·5 cm long, composed of two rather small, narrow tongue-shaped upper leaves and a lower part (the most striking) consisting of three broad, close-growing petals (see photo). The flowers of *L. cardinalis* are amongst the most attractive of all aquarium plants.

Plants from the natural state or from a garden are not the most suitable for planting in an aquarium. Emerse plants can be reproduced by means of 6-10 cm cuttings, which are grown on in a greenhouse with sufficient humidity. The stems now lie along the ground, they rapidly increase in length and if their 10-15 cm long vegetative tips are used to establish new submerged growth, they usually adapt without difficulty. It is advisable not to deliver to specialised dealers, without any acclimatization period, plants which have been cultivated as an emerse form in greenhouses. They normally need at least two to three weeks in which to adapt to submerse conditions, in the same greenhouse in which they have been cultivated as emerse plants.

Submerse plants are usually offered by dealers under the fanciful name of "Cryptofolia". They grow relatively slowly under water, but in a well illuminated tank containing old water with a pH value around the neutral mark it is quite easy to achieve success in cultivating these plants. Submerse *L. cardinalis* are positioned in groups of 3-5 plants in the central area of the aquarium. They usually attain a maximum growth of 20-25 cm. The stems are greenish-white under water, the leaves bright green and longer and narrower than is the case with emerse plants. The usual size is 5-6 × 1 cm. The central vein is deep set and the edges of the leaves are clearly serrated. Given sufficient nutrients the plants may reach the surface, where they form emerse parts of the stems and flower, even in a relatively deep tank. This tends to be the exception to the rule, however, and occurs more often in the case of the somewhat rarely cultivated and larger species, *L. splendens*. If it is one's intention to obtain flowering specimens of submerse plants of *L. cardinalis* in the aquarium, it is better to transfer the plants to flower pots which are then stood in shallow water. The most favourable time for this is April to May. The plants then develop as an emerse form and flower from August until October.

Scarlet flowers form in clusters at the ends of the emerse stems

A RARELY KEPT CHARACIN

by R. Zukal

Pair of *M. Pittieri*, male on left

IT WOULD CERTAINLY be interesting and perhaps revealing too in terms of statistics to know which fish species or genera are kept most by aquarists. Personally, I am convinced that the number of species is not very big. I have very often made the observation that again and again the same small number of fish species are sold or offered for sale in aquarist dealers. It is not my intention to sit in judgement or give advice here, for individual tastes differ. Wiener Schnitzel may well be consumed more than any other dish for lunch, although there are no doubt better and more nutritious foods.

I merely want to emphasise that every fish has a certain attraction—a certain 'something' or it attracts attention by its interesting way of life, the extra care it takes of its young or some other characteristic. And yet the characin, *Moenkhausia pittieri*, is so rarely seen in the tanks of tropical fish hobbyists. Why? Is the explanation to be found in the too bright coloration of the fish? One cannot always have the colour red? Perhaps the reason is to be found in the fact that the fish vegetates in unsuitable light conditions in dealers' shops? I can think of no other explanation. When I observe this fish in my densely planted tank I marvel at its truly brilliant coloration. The sides of its body are decorated with greenish, shimmering, metallic dots. The fins are grey, transparent and edged with white. The upper iris is red. The male has sturdy fins, with the dorsal fin elongated and curved into a sickle shape.

These characins are relatively undemanding, peace-loving fish which like to live in a shoal with their fellows of the same species or with other characins. One can keep them in largish or medium-sized, well-planted tanks, at a temperature of 22° C in medium-hard, slightly acid water. They come from Venezuela (Lake Valencia), Rio Bue and Rio Tiquirita. They were imported to Europe in 1933. They grow to about 6 cm, whereby the female remains smaller than the male. The males indulge in entertaining, harmless fights. They are not particularly selective as far as food is concerned, but they must be given a nutritious and varied diet.

Breeding these characins cannot be described as easy. If, however, a suitable pair are put into service, there are no special difficulties. In order to breed them I prepared a 15 litre glass tank. Two thirds of the water came from the breeding tank, with one third from the tap. It was slightly acid (pH 6.8) and was medium-soft. For a few days I had observed a pair which had distanced itself from the other fish and I introduced the two fish into the rearing tank. The temperature was 28° C. The fish were alarmed and shyly hid themselves behind the plants. Only after a few days did I realize the big mistake I had made and placed a few floating plants on the surface in order to reduce the amount of light in the tank. Before long the male swam hesitantly out into the open and showed himself. As soon as the female also appeared the male spread his fins and put on a display. After some hours of chasing and driving the fish were stimulated and the female, followed by the male, sought a suitable spawning site. The fish pressed against each other, there was a lightning-fast turn, almost a leap one might say, and the fish fell away from each other. The eggs fall on to the plants where some of them adhere to the leaves, the rest sink to the sand at the bottom of the tank. Within two to three hours 100-200 eggs are produced. After spawning the fish must be removed, for they are great cannibals, just like the majority of characins. The brood hatches after about 30 hours and on the sixth day when they are free-swimming they are offered the finest food. The young grow relatively quickly and looking after them subequently presents no special problems. I trust these splendid fish will not be forgotten.

Notes on the habit of genera *Imparfinis*, Eig. & Norris 1900, and *Rhamdia*, Bleeker 1858—

by David Sands

The small creek at Brotas, southern Brazil, was surprisingly full of small fish

LAST YEAR in Brazil, Stephen Pritchard and I spent a short time at São Carlos University with Dr. Garavello with the object of collecting catfish in the nearby localities, away from the coastal streams of our base at São Paulo.

Dr. Garavello is known for his published work on the dwarf loricariids, of the genus *Parotocinclus*, and is currently working with Dr. Britsky of São Paulo University Zoology Museum, on a revision of the sub-family *Hypoptopomatinae*, (*Otocinclus*-type catfish).

São Carlos

Our first day at São Carlos, a small town about 100 miles from São Paulo city, was spent collecting in the university grounds at a lake outflow. In this narrow outflow, we caught *Geophagus* and *Poecilia*, some *Rhamdia quelen* (Quoy & Gaimard, 1824), plain yellow/brown specimens and many *Hypostomus*, a light and dark brown irregular striped variety.

After spending an evening on campus with amiable students, we travelled the next day from São Carlos, south west (about 70-100 miles) towards Brotos, which is known for its hydro-electric dam. We were accompanied by Dr. Garavello and two fish collectors. Dr. Garavello and I had decided to visit the creeks around Brotos and collect *Corydoras aeneus*, Gill 1858, this locality having been confirmed by his small collection of preserved fishes.

BROTOS

The long road journey to Brotos was concluded along an uneven farm track. We arrived at a small stream, unnamed, but it joined a deeper river, Jacare creek, which in turn flows into the Rio Jacare. The small creek was nondescript, it meandered across a field in various widths from 3 ft. to 6 ft. The water depth varied from about 1 ft. to 5 ft. and the flow, although very slow, did pick up speed at several water drops. Thermometer reading revealed a temperature of 68°F and a handful of substrate showed it to consist of sand/silt. Initial seinings revealed many *Poecilia* and small Characins; we also used circular 'sieve' hand nets to fish against the creek banks where vegetation dropped into the water. Our nets caught shrimps and small crabs in great numbers and a few dwarf *Hypostomus*, which we confused at first with *Pseudotocinclus*, but later examination proved they lacked coracoid platelets which are present in the latter genus.

Corydoras aeneus

In a small backwater, which seemed to be a cattle crossing, we netted many *Corydoras aeneus*, in a depth of water less than 12 in.

The length of the creek we sampled, yielded two types of small slender pimelodontids, none of them larger than a few inches long. The smallest of the two types, about 1½ in. (38 mm) long, had an irregular bone rimmed head, a ground colour of pale yellow with a thin mid-lateral stripe. This was initially identified as *Nannorhamdia* (*Nannorhamdia* Regan, 1913 = *Imparfinis* Eigenmann & Norris, 1900), which I traced to *Imparfinis* (see Dr. Mee's Revision of the Surinam representatives of the families Auchenipteridae and Pimelodidae.) Dr. Mees remarks that the genus *Imparfinis* resembles the genus *Rhamdia* but differs by the following: the posterior border of the skull appears to cut off straight, the dorsal and pectoral spines are very inconspicuous continued as soft rays, the maxillary barbels are short to moderate in length and the adipose fin is quite short.

Imparfinis

Imparfinis have a wide distribution throughout tropical South America, east and west of the Andes and Central America through to Costa Rica (Pacific drainage).

We netted fewer *Imparfinis* than *Rhamdia*, approximately one to five ratio, but as the former were smaller than the latter, they could be more difficult to catch. Of the three species of *Imparfinis* mentioned in Mees, 1974, I thought the description of *Imparfinis minutus* (Lutken, 1874) tied up best with the fish we collected. The description of *I. minutus* is as follows: "the colour in life is light grey—yellow, pale below. Large specimens have pigment concentrations on the lateral line and on the middle of the back between the dorsal and adipose fins. The smallest specimens have a narrow, dark stripe from

A beautiful species of *Hypostomus* confused initially with smaller loricatiids, pictured here after the author's return to the U.K. The creek contained thousands of different coloured specimens all about 1½ in. long. The six specimens brought back to Britain have grown to 4 in. in length in two years

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THE MASTER FISHERMAN

by Les Stocker

A PATCH of water in the garden attracts all types of wildlife whether intentionally or not. Some visitors are welcome and others are nuisances but even if not welcome that master angler, the heron, will be the most spectacular visitor of all. Standing up to three feet tall with a vicious bill that will capture any fish that comes within striking distance, the heron is unmistakable with grey upper parts, a black crest, black markings on a white chest and, most obvious of all, that deep yellow bill. It is often said that Old Franky, as he is known in country areas, spears his catch; in fact he clamps it between his upper and lower jaws in a vice-like grip from which a fish would be lucky to escape. So adept is the heron at catching fish that it was once thought that a powder, from amongst his down feathers, was used as a lure to attract prey. Actually, the powder is a built-in cleaning agent used to clean the plumage after the frequent encounters with slimy eels, a heron's favoured food.

Apart from easily approachable fish, herons are also partial to mice, frogs, toads, beetles, voles, moles and rats, doing their stint at keeping vermin under control. Unfortunately, at present, some fishkeepers are shooting and trapping 60-100 herons each week, their excuse being that the big birds are pillaging their pools. Admittedly herons will take fish but can be deterred by not letting them get a firm foothold in shallow water. With pools having straight sides to a depth of 12 inches the birds are not able to stand and fish. Another ploy is to fix string or polythene floats around the waters edge; once again this prevents Old Franky from gaining a foothold. Those fishkeepers with ornamental pools will find that a stone figure of a heron will be a most effective deterrent.

I believe that herons have suffered excessive persecution over the years; what a disaster it would be if this were to continue and our countryside were to lose more of these most spectacular birds.

The Heron's fearsome bill

Continued from page 29

the middle of each eye over the snout to the upper-lip—in larger specimens this stripe becomes indistinct." This more detailed description certainly seems to fit the specimens we collected; the largest examined by Dr. Mees had a standard length of 91 mm so the juvenile description would tie up with the small fish we collected. I do not, of course, possess the expertise to compare or check the osteological characters given by Dr. Mees, or indeed many other taxonoenic characters given by him.

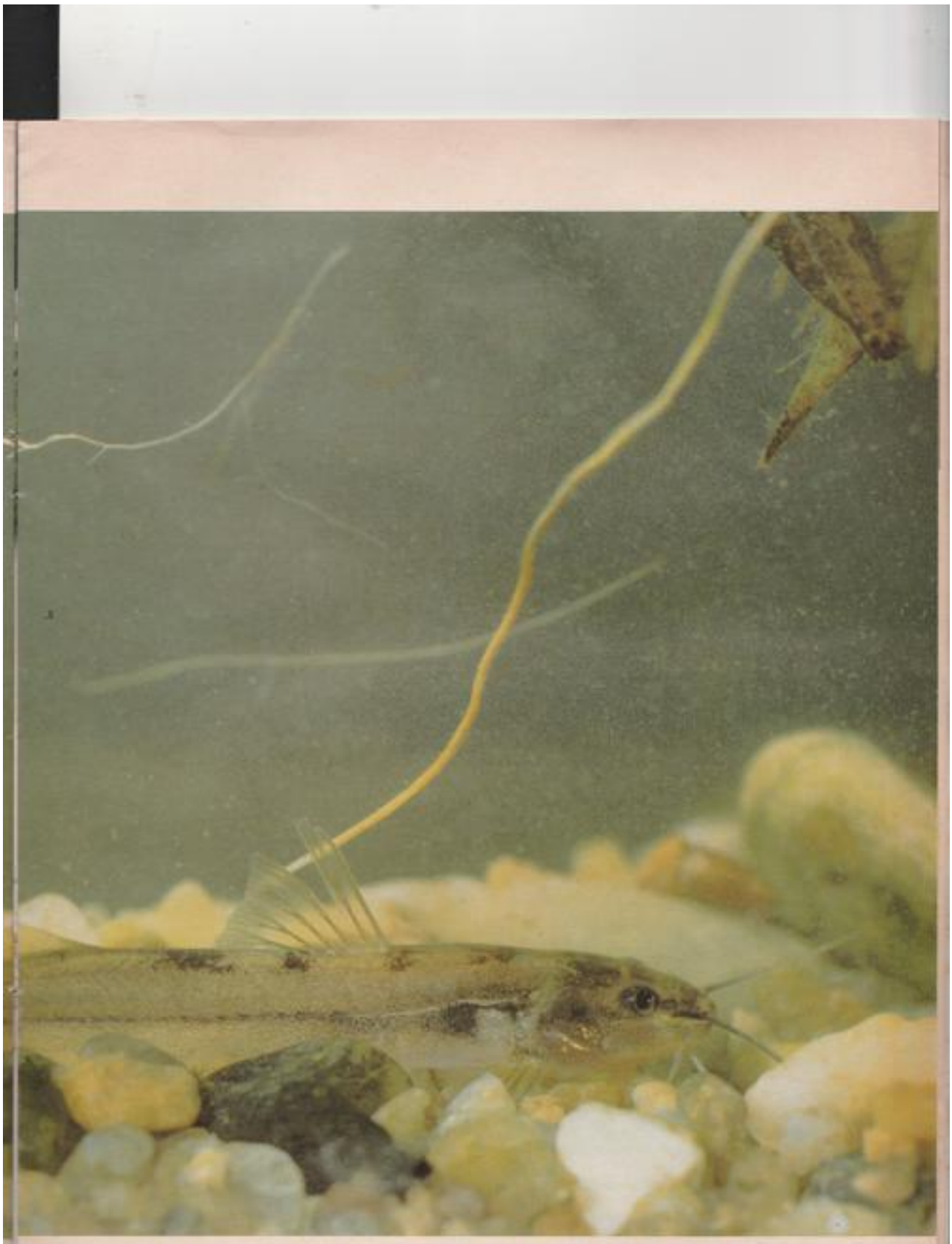
The *Imparfinis* we netted were found, as previously mentioned, amongst aquatic grasses but perhaps I should add that they were usually found where the creeks ran into a small water drop and picked up speed.

Rhamdia quelen

In contrast, the *Rhamdia quelen* were netted at most points along the creek but in greatest quantities where the vegetation spilled from the river banks. The largest specimen we caught, I recorded with a standard length of approximately 65 mm and represented juvenile specimens. Dr. Mees recorded a specimen with a standard length of 212 mm. Our Jacare creek specimen differed in coloration to the São Carlos specimens, in fact they had the same coloration as defined for the species, a yellow brown ground colour with an uneven number of dark speckles distributed across the body. I brought back to England several live specimens (the *Imparfinis* did not survive) of *Rhamdia quelen* and in aquarium condition they grew at an extremely fast rate. In two months they doubled in size and in five months they had grown from the collected size of 65 mm to 240 mm. The ground colour changed dramatically from yellow/brown to grey and the speckles, although visible, tended to merge into the new ground colour.

Towards the end of the day's collecting we did attempt to fish the much larger main Jacare creek, but the waters proved too swift and dangerously deep.

The only photograph taken of *Imparfinis* alive. These tiny catfish did not survive the rigours of capture and transportation



Continued on page 36

Coldwater Jottings

by Frank W. Orme

MARCH HAS possibly the most pronounced weather variations of any month of the year. It can bring cold, strong, north-west winds, often reaching gale force, and sleet or snow showers. Occasionally the warmer south-westerly winds which encourage a rise in the temperature will make us realise that the spring is slowly taking over from the winter. Most gardeners are very wary of this month, because March nights can often turn frosty; however, the coldwater fishkeeper usually looks upon it as the start of the fish breeding season for those which are kept in the indoor tank, be it in the home or fish-house. Indeed, some aquarists will, by the use of artificial heating, have already spawned their fish.

Common sense

Although there is no magic, or secret methods, required to successfully breed either the koi or goldfish it is necessary to use common sense and have a degree of patience. Common sense means making certain that the breeders are a true pair, in other words a male and female. The pair must also be of a suitable size and age, well fed and in first class condition. Very young, undersized fish will prove difficult and if they are also poorly fed and sickly they will prove almost impossible to bring into spawning condition. Patience implies giving attention to the care of the fish and allowing them to come into breeding condition without undue haste. Although the pair will spawn when the time and conditions are right, they cannot be forced—in fact, too much interference may well delay the act of spawning.

When the fish are active and readily consuming food, and the water temperature is around 60°F. (15·6°C.), the process of conditioning the fish can commence. At this time it may help if the pair are separated. Offer plenty of good, nourishing food with a predominance of live-foods—especially small, red earthworms chopped into a suitable size. Feed as often as the fish will accept food, but ensure that the tank is kept clean. After a time, if the pair are a true breeding pair, the male will develop small white pimples (tubercles) around the region of the head or gill-plates and, generally, on the pectoral fins. The female will become a little more plump than usual, as the ova distends the belly in the region of the vent; quite often this distension will be more noticeable on one side than the other when viewed from above. These signs are not infallible indications of the sex of a fish—females have been known to develop tubercles—but, as a rule, they are a reasonably safe guide. Nor should the fact that one fish is seen chasing another be accepted as a guarantee that they are of opposite sexes; it is not uncommon for males to chase other males and, similarly, for females to chase females.

Egg-eaters

Most fish will avidly consume fish-spawn, including their own, and will seek out any young fish which is small enough to be eaten. Koi and goldfish are no exception to this rule. Some thought must therefore be given to the provision of separate accommodation for either the adult pair or their eggs. Most breeders prefer to remove the adults, after they have finished spawning, leaving the eggs to hatch where they were deposited. The ideal is to provide a separate aquarium, of sufficient dimensions to comfortably house the chosen pair. This tank is furnished with nothing more than the

Male shubunkin showing sex tubercles on gill

bunches of fine-leaved plants, or wool-mops, which will receive the fish-eggs. These can be weighted down at both ends of the tank so that a free swimming area is left for the fish, but no gravel is necessary. By adopting this method it becomes a simple matter to keep the base of the tank clean and free of any fish-droppings or uneaten food.

When it is thought that the fish are ready to spawn the male can be placed in the prepared spawning tank, which should have been set-up some days previously and allowed to settle down for a few hours before the female joins him. If the male is placed in the tank during the morning the female can follow that evening. Should the male show interest in his partner by following her around and occasionally pushing her into the spawning area, it is possible that they may spawn the following morning. Should this not occur, be patient. Continue to feed with earthworms and keep the tank base clear of any debris and, sooner or later, if the conditions are right the fish will spawn.

The spawning act cannot be mistaken for the chase is vigorous, as the male wildly pursues the female until they both enter the area of the plants, or wool mops. There the female will shed a number of eggs to be fertilized by the male. The vigour of the chase is such that the fishes may lose some scales or suffer fin damage. However, they should not be interfered with. Given time and proper care the injuries will be repaired—lost scales will be replaced and torn fins will heal. As the eggs are shed they will scatter and fall through the water, to adhere to anything with which they come into contact. A close inspection will reveal that the eggs are roughly the size of a pinhead and a translucent clear to amber colour. Around mid-day the fish will, probably, begin to lose interest in spawning and, unless removed, start to eat the spawn.

Hatching

Having removed the adults, carefully siphon over the base of the tank to remove any sediment or other unwanted matter; then refill with water of a similar temperature. If the water temperature can be raised to around 70°F. (21°C.) it will lessen the time required for hatching to about three days. Infertile eggs will turn white and develop a form of fungus. At first glance it may appear that every egg is white, but it is more than likely that there will be a good number of less conspicuous fertile eggs so, again, patience is necessary. After a time the fertile eggs will become more obvious as the developing alevin grows. Most apparent will be the eye. Shortly after the observer will notice a curved black line; this is the notochord which will become the backbone of the fish. As the hatching becomes imminent it will be seen that the tiny alevin will begin to make vigorous twisting movements as it attempts to free itself of the egg case. The following day the tank will contain a number of minute glass-like splinters hanging from the spawning material and the walls of the tank. These are the babies that have been awaited and care should be taken not to disturb them.

Approximately twenty-four hours later these little splinters of life will have become free-swimming and actively seeking food. However, they must first inflate their swim-bladder. With much effort, and many rests, these tiny creatures will gradually make their way to the water surface to inflate the swim-bladder—if disturbed they will fall to the bottom and have to start the difficult journey again. Many may not succeed at the second attempt and they will eventually die. It is at the free-swimming stage that the first food may be introduced, this should be plentifully supplied and can be either *infusoria* or newly hatched brine shrimps. Although very fine artificial foods can also be used, they should only be employed as a last resort because of the danger of pollution if uneaten.

Common sense and patience will bring their reward and, if the first attempt is not successful, do not be disheartened but try again—success will come.

OSCAR **G. Robinson**

Continued from page 33

On reflection it would seem possible that the adult catfish spawn in the shallow creeks of the type we collected from and then return to deeper waters; the absence of adult specimens in our collection would tend to support this theory or may simply suggest that adults are more difficult to catch, perhaps swifter and more nocturnal in movements.

The small creek did not reveal any large predatory fish in our nets so the conditions would seem ideal for juveniles.

Rhamdia quelen has a wide distribution also, throughout tropical South America including the island of Trinidad. The description shows several differences to that of *Imparfinis*. The head is moderately depressed, the maxillary barbels long, extending beyond the dorsal fin, the pectoral spines are strong and the adipose fin is long.

As a footnote, I should record that the water conditions and temperatures probably reflected the winter period during which we visited Brazil. This time is usually the fish breeding season and this would explain the number of young fish we found. I hope these notes will give some pointers in helping us to recreate the natural conditions for these types of catfish. For instance, by styling an aquarium with vallis grasses, bent by a power filter flow, we could perhaps, discover more about the habits of these smaller pimelodids.

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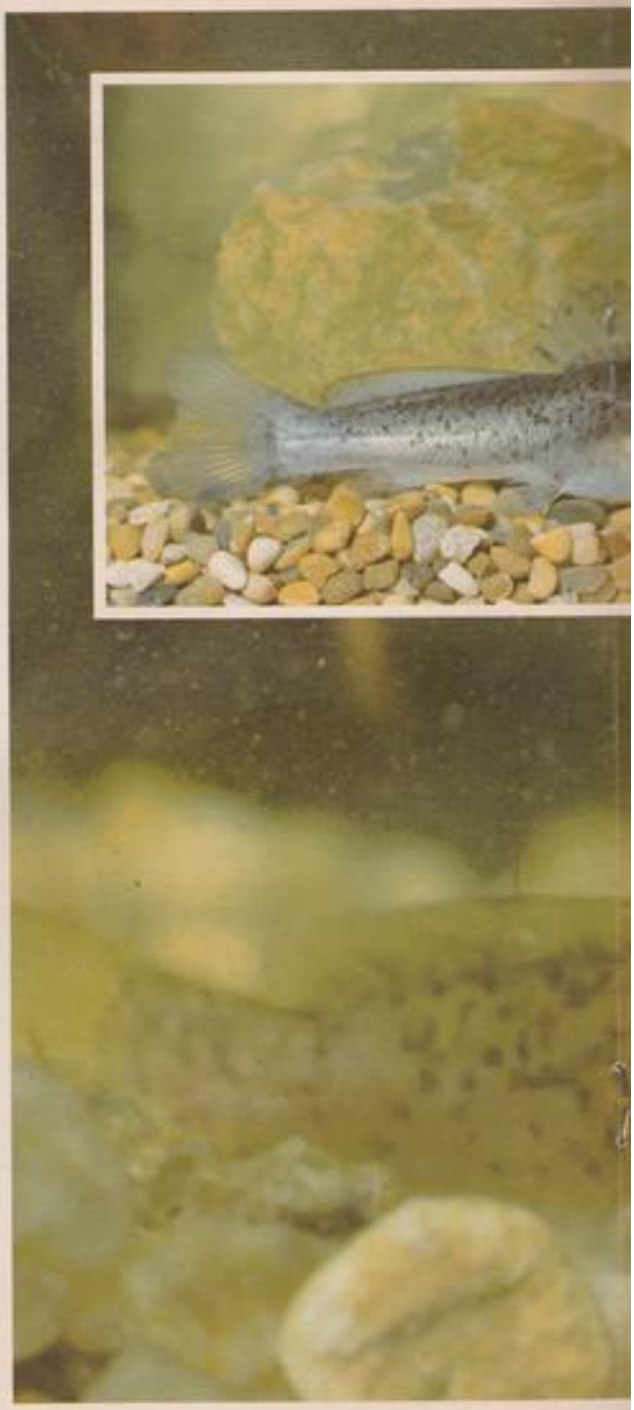
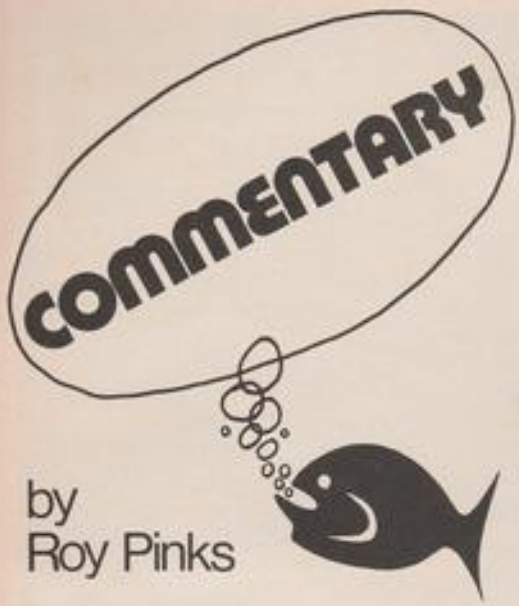
Mees, G. F. 1974. The Auchenipteridae and Pimelodidae of Surinam.



The same specimen as shown below but after six months under aquarium conditions and all the tan colouring has given way to grey

Rhamdia quelen. Pictured moments after capture



by
Roy Pinks

EACH WINTER brings increasing financial headaches for the tropical fishkeeper, who has to stretch his ingenuity to its limits in keeping power bills to an acceptable level. Hardest hit are the fish house enthusiasts, many of whom are simply giving up or being driven indoors, perhaps to the sanctuary of the spare room. It is doubtful if very much more can be devised in the way of improved insulation technique, but I have recently considered whether disciplines in the actual usage of electricity might be turned to some advantage.

Tariff 7

It was Sue at the office who turned me in the right direction. A bright and resourceful young housewife, she was extolling the advantages of the local Electricity Board's Tariff 7, which offers off peak power at reduced prices. In general terms, you pay about £2 a quarter more for the hire of the meter, and a little more for your daytime electricity. But for 7 hours during the night the charge is about half that of the day rate. You can get a feel for whether this is likely to benefit your particular household by telephoning your local sales office: they simply look up your past consumption history, ask a few questions about what you use power for, and then tell you whether you are likely to benefit from the Tariff 7 arrangement. It has, of course, particular appeal to those who use night storage heaters, but the interesting fact is that *the whole* of your electricity supply is switched at night, not just that connected to the off peak timing meter.

There will be many serious aquarists who use the ambient temperature in their rooms to back up the temperature in their tanks, and where large scale collections of aquaria are concerned, the night storage concept will be attractive. It might be noted that modern night storage heaters are more adjustable than their predecessors, and some thermostatically controlled, so there is now a means of utilizing the daytime output to greater effect. In the case of the old types, the things just poured out their heat willy nilly, and they needed an afternoon boost. These unsatisfactory features have now been eliminated (but note that the old type of heater is useless with Tariff 7 installations—this is why so many are being given away free just now). It is worth bearing in mind that you can buy a night storage heater, fit it with a time switch and a length of cable and simply plug it into a power point. This is much cheaper than the heavy installation charges of about £35 levied by the boards for fixing these equipments in your home.

All Day Running

In considering the merits of all this I wondered whether it was worth running all the air pumps for 24 hours a day. When you consider the real value of aerators during the day, when plants are discharging oxygen, it is debatable whether they do any good at all apart, possibly, from mixing up the warm water with the cold. If you are keeping large and active fish, they do this for you anyway in the course of their peregrinations. And, bearing in mind that thermal layers exist in nature where there are no such things as aerators, it makes you wonder whether such bracing conditions might in fact benefit your fish rather than the reverse. There are those who will howl that temperature changes will cause White Spot, but I don't really believe that this actually happens other than in the case of seriously stressed fish. At night there is clear benefit from aerators in breaking up the carbon dioxide discharges. A side benefit from having the pumps off during the day will be that of eliminating noise, and I can almost hear the sighs of relief from several correspondents who have written to me with much feeling on this very subject.

Night Storage Tank Heaters?

What we need, of course, is a development in heating technology in which tank heaters can be engineered, in like fashion to night storage heaters. It is true that even now you can situate tanks in such close proximity to them that they can be directly heated, but it would be rather nice if we could have a rod which collected the warmth during the night and gradually dissipated it into the water until the next boost. I am sure that some enterprising firm will take up this suggestion and make a small fortune out of it. And I am equally sure that in doing so they won't even send me a free one to try out!

Well, we took the plunge and had the meters put in the other day. The snags so far are that I find it tiring waiting up until half an hour after midnight to watch the things click over in the meters—it is by far more

fascinating than TV—and the silence in the house without aerators is deafening. I should add a postscript that I would not recommend a 7 hour restriction for under-gravel filters, especially those fitted in marine tanks. However, they could still use Tariff 7 because owners would benefit from the lower rates during the 7 hour off peak period.

Plastic Plants

Although I am not addicted to plastic plants, it must be accepted that some are extremely well presented and are almost indistinguishable from the real things. In fact, since snails do not nibble them, nor do the gouramies, they tend to look more respectable than most natural ones. There are also many aquarists who simply cannot cope with the technique of growing tank plants successfully, and who turn in desperation to something more permanent and cheaper in the long run. Seemingly, one of the difficulties in managing plastic[s] to get knocked over by the m[ost] that point some aquarists ju[st] market. Those on the point [of] from an excellent suggestion [by] who used the suckers from [the] for the plant stems (these happened [to] in place of the cups provided). She then [put] gravel on the tank base aside and affixed the sucker[s] the flooring glass, then replacing the compost. After some period of use she found that this worked well with the types of plant compatible with this make of sucker, but I imagine that it would not be difficult to marry such attachments to almost any sort of plastic plant base. I think I would consider fusing them together using a hot soldering iron, or employing a silicone sealant in cases where the mating of the two elements was not immediately possible, or where a bad fit was likely.

Book Reviews

Cyclopaedia of Coldwater Fish and Pondlife *by Frank W. Orme.* Saiga Publishing Co. Ltd., £8·50.
Coldwater Fish in Aquaria and Garden Ponds *by Roy Pinks.* John Bartholomew & Son Limited., £1·25.

The two books under consideration are important enough to warrant the coldwater enthusiast's non-dallying attention. Mr. Orme's book covers a wealth of tips and pieces of information under the entries A to Z. There are, for example, some quite notable entries concerning goldfish and koi. He explains such tongue-twisters and puzzlers (we are not all blessed with a knowledge of zoological terminology) as heterzyogotic, necrophagy, platyhelminthes, taxis (what the so-and-so have taxis to do with fish, anyone might think or ask? The answer is "taxis" in the world of zoological science refers to certain components of animal behaviour). But let no aquarist be put off by what he may believe to be a book above his head. There is enough and more about the down-to-earth things such as how to breed white-worms, the treatment and recognition of disease and disorders, pond layouts and construction, plants to grow in and all about a pond, and so on and so forth. It made me happy to find a goodly amount of space devoted to the lovable and knowing toad, the lively and, at times, entertaining frogs (both amphibians useful in the garden as destroyers of most slugs, young snails, woodlice—to name a few of the gardeners' chief headaches) and our three native species of newt. The book is generously adorned with better-than-usual line drawings and full colour illustrations of moisture loving and underwater plants, crustacea, water bugs and insects, amphibians, and our native and introduced species and varieties of exalted forms of pond and indoor tank fish.

I learnt not a few things as I went through the book by Mr. Pinks. This after reading hundreds of books and periodicals published here and abroad over the past 50 years. Every writer who knows his subject well but is limited in the number of pages he has to fill is obliged to give much thought as to what to put in and what to leave out.

Coldwater Fish in Aquaria and Garden Ponds is an attractively produced paperback. The author tells us in the introduction that, 'The behaviour of fish is so unpredictable that it is not possible to make rigid rules as to their care and treatment.' This is certainly true. Your reviewer is of a literary turn of mind and those few who know me well would say a bit of a bibliomaniac. There is no question that Mr. Pinks has an admirable vocabulary and a good prose style. These two talents make his book all the more readable. Mr. Pinks covers about everything to guide the coldwater aquarist along the road to success. Apart from all this he informs his readers of some of the best plants (knowledge gained by a few decades of practical experience), that is plants for aquarium or pond. For the latter: plants for the bottom, the shallows, a bog and the dry or drier background. Surprisingly there is a most helpful guide to house plants ideally suited to growing nearish the aquarium to break up stark rectangular forms and place on adjacent shelves or in alcoves. It is regrettable that the author was obliged to bring his book to a close in page 96. However, the final pages are given over to *Useful Data*, a well-considered *Recommended Reading* and a 3-page *Index*.

JACK HEMS

WHAT DO YOU want for your money? A quality product that fulfils its promises; pronounced customer satisfaction; a selection of value-for-money market leaders; good profitability and a fast turnover?

If it sounds too good to be true, then you are obviously not using or selling the *WATERLIFE RESEARCH INDUSTRIES LTD* range—a complete weaponry to overcome all the problems an aquarist might face be it seawater, freshwater or pond fishes.

Heading the range are the two best-selling salt mixes—*NATURA* and *SYNTHETICA*. For the man who wants the best there is nothing to beat "Natura," not even the ocean. With its precisely formulated trace elements, packed in a separate bottle, you can be certain of getting these vital elements in just the right proportions no matter how little salt you mix. If you want to breed seawater fishes, keep octopuses or grow living coral then "Natura" is the salt for you.

If your sights are set a little lower then "Synthetica" with its blended trace elements will fit the bill. "Synthetica" is

Marine Aquaria Products

comparable in every way with the German and American blended salts and being made in Britain is also cheaper.

Both salts have been tried, tested and improved over many years, are respected throughout the World, and above all offer unbeatable value for money and results. But not even "Nutura" can maintain the quality of tropical ocean water without the regular use of additives.

Waterlife Research produces a complete range of water additives to keep your tank in peak condition.

The waste products of all fishes and invertebrates are acidic, so the water's pH will tend to fall. Regular use of *SEABUFF (CAT)* and *SEABUFF 'AN'* will counteract this fall, extend the life of your seawater and prevent the debilitating effects of a sudden fall in alkalinity on salt water animals and plants. Neither "SeaBuff (Cat)" liquid nor "SeaBuff 'AN' " can raise the pH above safe levels.

Metabollic processes in aquaria utilize trace elements and eventually seawater can become dangerously depleted in these vital chemicals. *SEATRACE* is the answer. Used once a week after the water is a month old, "Seatrace" will maintain the correct levels of these vitally necessary trace elements.

Another major factor in maintaining the purity of captive seawater is a healthy growth of green algae. The more you grow, the healthier the tank. *SEAGREEN* is a tried and trusted algal fertilizer, promoting rapid growth of green algae and phyto-plankton.

As a further boost to the plankters and to give the animals vitamins which are all too easily lost in food processing, a regular weekly addition of *SEAVITA* provides the answer. "SeaVita" also contains vitamin B_{12} which is proved to stimulate appetite, a boon when dealing with stubborn, hard to feed fishes.

With the water in peak condition you want to keep it that way and here too Waterlife Research's *NITRITE*, *NITRATE* and pH test kits and *SEADROMETER* and *PLUS-ULTRA* hydrometers came into their own.

The Nitrite Kit will measure as little as 0·125ppm and the Nitrate Kit down to less than 10ppm, while the pH test gives a complete colour shift from yellow to green, through fawn, to purple over its range of 7·6 - 8·5.

To check the specific gravity, use the Seadrometer, probably the most accurate little hydrometer in the world. But if only the best is good enough—go for the Plus-Ultra which is the accepted instrument in scientific circles.

Unfortunately even the best of filter systems cannot deal with all the fishes wastes but *SEACOAL* a top quality activated carbon, will remove these quasi-phenols, albumens and other large molecule chemicals.

If disaster, in the form of disease, still strikes then again Waterlife Research comes to the rescue. *CUPRAZIN* has been recognised as the brand-leader when dealing with salt-water protozoan and fungal disease for the last 15 years. Cuprazin will quickly and safely deal with the threat of oodinium, whitespot and fungus without fear of your fishes suffering from copper poisoning, since the product is biodegradable.

If the problem is flukes, parasitic copepods or worms then *STERAZIN* is the automatic choice. Sterazin is safe with all invertebrates except crustacea but as Sterazin is rapidly biodegradable, crabs and shrimps can quickly be returned to their "home" aquarium.

For the man keeping fish and invertebrates together *MYXAZIN* is a God-send. Myxazin is a well-tried (8 years as brand-leader) preventitive of oodinium and whitespot and a sure cure for bacterial problems caused by all gram-negative species of bacteria such as Pseudomonas, Vibrio, etc.

NB:—*Neither Cuprazin, Sterazin nor Myxazin is harmful to nitrifying bacteria.*

When any disease strikes it is doubly important to maintain a high oxygen tension in the water. Aeration through a wooden *SEAMIST* diffuser is the best way to achieve this. Diffusion through a SeaMist is vital when using ozone to present a large interface between the ozone and water.

To help newcomers to marines Waterlife Research supplies the beginner's bible—*Tropical Marine Aquaria* by G. F. Cox; a step-by-step leaflet called *Setting up a Marine Aquarium* and an easy to follow disease diagnosis chart covering marines, freshwater tropical and coldwater fish, entitled *The Diagnosis, Treatment and Prevention of Fish Diseases.*

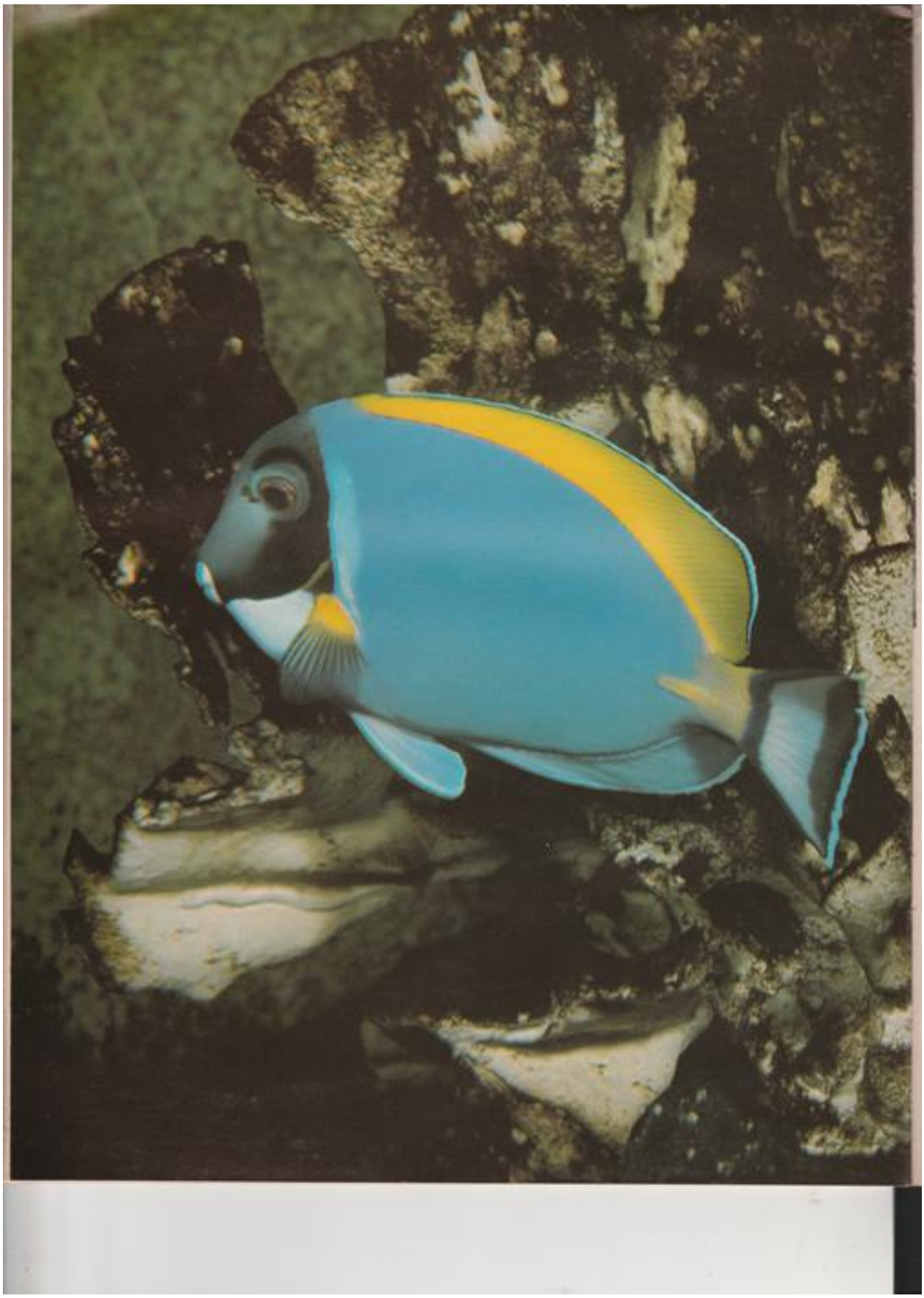
INVERTFOOD, WATERLIFE'S specially formulated liquid suspension food for marine invertebrates *and fish fry of all species* has to be seen in action to be believed. Within two minutes of adding the incredibly economical "Invertfood" to a tank containing invertebrate filter-feeders, every single animal will be seen to blossom out into a frenzy of feeding activity. "Invertfood" is fully stabilized and will not go "bad" even if the cap is accidentally left off for a few hours.

Finally, we advise all aquarists with tanks larger than two gallons (5 litres) capacity to obtain a *WATERLIFE DROP COUNTER*. These lowly priced units save time and prevent possible error when counting out large numbers of drops.

New food from Tetra

TETRA CICHLID LARGE FLAKES, manufactured in West Germany by Tetra, and distributed in the U.K. by the Tetra Information Centre, 15 Newlay Lane Place, Leeds LS13 2BB; available in 80 gram 2·82 oz. 500 ml. drums at a recommended retail price of £3·49.

This new flake food from Tetra contains only red and black flakes, presumably dyed these colours, and is intended to be a special food, consisting of large flakes, for cichlids and other large fish. The food is supplied in a yellow cardboard drum with blue lettering and a yellow plastic upper rim, a metal base, and a blue plastic screw-on cap. The upper rim of the container is sealed with a circle of metal foil which, I assume, keeps the unopened food fresh. One tears off the foil to open the drum; after which the well-fitting plastic lid no doubt ensures that the food remains fresh.



SPOTLIGHT

Powderblue surgeon

by Martyn Haywood

Specific name: *Acanthurus leucosternon*
Common name: Powderblue surgeon
Range: Indian Ocean
Size: To 9 inches approx.

In the Powderblue surgeon we have one of the most instantly recognised marine fishes. There is no other tropical marine with which it could possibly be confused and for once we have an animal which is not burdened by a surfeit of common names. One has only to ask for a Powderblue to obtain what is undoubtedly one of the most dramatic fishes commonly kept in home aquaria.

The fish's stunning colours have stimulated a huge demand for the species and fortunately for hobbyists this is not a fish which is caught the odd one or two at a time. In the wild A leucosternon can be found grazing over the coral reefs in shoals of thirty or forty, picking at algae and small organisms. However, they are not reef fish in the sense of having a small territory into which they retreat when alarmed. Instead they flee towards deeper water when frightened. This behaviour simplifies their capture and obviates the need to use drugs or poisons.

In Sri Lanka, the main source of supply, the following catching technique is used. One diver, or more usually, two, will observe a shoal's movement and then set up a barrier net on the nearest space free of large coral growths. The net may be ten or more metres long and about a metre and a half deep and has a very fine mesh. When erected underwater the mesh is almost invisible. The fish are then herded towards the net and become entangled. It is then a simple job to remove them to the catcher boats from where they begin their long journey to the hobbyist market. This method often results in minor tears in the fins and skin abrasions but as these soon heal this is a minor price to pay for the assurance of buying an undrugged fish.

When buying a Powderblue these minor injuries can be ignored provided there is no sign of reddening around the wounds, as this may indicate the onset of bacterial infections. Apart from the obvious question of whether a particular specimen is eating or not, a good indication of the fish's general health can be gauged from the white patch below the jaw. This should be a pure, enamel white. Any hint of greyness is usually an indication that all is not well. In contrast the richness of body colour is not too important, particularly if the fish is plump and active. When housed in the necessarily spartan tanks of dealers the rich cobalt blue will often fade. Normally deep colouring is soon restored in the more settled and rock-strewn home aquarium.

However, having said that this is a very popular species, it does not follow that it is a particularly easy one to maintain in the long term and indeed many die within a few months of purchase. This is most often the fault of the aquarist rather than any inherent weakness of the species. All the surgeon fishes are open water animals and unlike most coral fishes, which live their lives in a comparatively small territory, they are used to large swimming areas. They also frequent the surge zone where strong turbulence ensures water with a very high oxygen content. Powderblue surgeons are no exception and even the smallest should not be kept in a tank of less than thirty or forty gallons capacity. Unfortunately small specimens are few and far between. Most that are offered for sale are five inches long or more and these, of course require considerably greater volumes of water.

Their dietary requirements must also be considered. Looking at their mouths reveals rows of very fine, almost hairlike teeth, which, along with the restricted jaw movement indicate an adaptation for scraping algae and micro-organisms from rocks and corals etc. This tooth structure and function is comparable with that of the mbuna Malawi cichlids which have similar feeding habits. It follows then that Powderblues need a large proportion of vegetable matter in their diets and, like other vegetarians, they are used to a life of continual grazing.

This should be provided for by promoting vigorous algae growth throughout the tank and feeding with vegetable flake and frozen foods, supplemented with small feeds of irradiated mysis, brine shrimp and chopped shellfish. It is also very advisable to use a vitamin supplement such as SeaVita on a regular weekly basis.

These comments on feeding apply to all the Surgeon fishes, a name which must seem as totally incongruous to non-marine fishkeepers as Oscars must seem to newcomers to the hobby. Looking at the illustration, the Powderblue seems to be an inoffensive species—small mouthed, no sharp spines and very small teeth. However, this group as a whole is by no means defenceless, or indeed, entirely peaceful. Hidden in grooves near the tail lie two retractable bone 'scalpels', one on either side of the fish. These two razor sharp blades can be erected at right angles and, by flashing up against another fish can inflict serious and occasionally fatal injuries. It is

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In Sri Lanka, the main source of supply, the following catching technique is used. One diver, or more usually, two, will observe a shoal's movement and then set up a barrier net on the nearest space free of large coral growths. The net may be ten or more metres long and about a metre and a half deep and has a very fine mesh. When erected underwater the mesh is almost invisible. The fish are then herded towards the net and become entangled. It is then a simple job to remove them to the catcher boats from where they begin their long journey to the hobbyist market. This method often results in minor tears in the fins and skin abrasions but as these soon heal this is a minor price to pay for the assurance of buying an undrugged fish.

When buying a Powderblue these minor injuries can be ignored provided there is no sign of reddening around the wounds, as this may indicate the onset of bacterial infections. Apart from the obvious question of whether a particular specimen is eating or not, a good indication of the fish's general health can be gauged from the white patch below the jaw. This should be a pure, enamel white. Any hint of greyness is usually an indication that all is not well. In contrast the richness of body colour is not too important, particularly if the fish is plump and active. When housed in the necessarily spartan tanks of dealers the rich cobalt blue will often fade. Normally deep colouring is soon restored in the more settled and rock-strewn home aquarium.

However, having said that this is a very popular species, it does not follow that it is a particularly easy one to maintain in the long term and indeed many die within a few months of purchase. This is most often the fault of the aquarist rather than any inherent weakness of the species. All the surgeon fishes are open water animals and unlike most coral fishes, which live their lives in a comparatively small territory, they are used to large swimming areas. They also frequent the surge zone where strong turbulence ensures water with a very high oxygen content. Powderblue surgeons are no exception and even the smallest should not be kept in a tank of less than thirty or forty gallons capacity. Unfortunately small specimens are few and far between. Most that are offered for sale are five inches long or more and these, of course require considerably greater volumes of water.

Their dietary requirements must also be considered. Looking at their mouths reveals rows of very fine, almost hairlike teeth, which, along with the restricted jaw movement indicate an adaptation for scraping algae and micro-organisms from rocks and corals etc. This tooth structure and function is comparable with that of the mbuna Malawi cichlids which have similar feeding habits. It follows then that Powderblues need a large proportion of vegetable matter in their diets and, like other vegetarians, they are used to a life of continual grazing.

This should be provided for by promoting vigorous algae growth throughout the tank and feeding with vegetable flake and frozen foods, supplemented with small feeds of irradiated mysis, brine shrimp and chopped shellfish. It is also very advisable to use a vitamin supplement such as SeaVita on a regular weekly basis.

These comments on feeding apply to all the Surgeon fishes, a name which must seem as totally incongruous to non-marine fishkeepers as Oscars must seem to newcomers to the hobby. Looking at the illustration, the Powderblue seems to be an inoffensive species—small mouthed, no sharp spines and very small teeth. However, this group as a whole is by no means defenceless, or indeed, entirely peaceful. Hidden in grooves near the tail lie two retractable bone 'scalpels', one on either side of the fish. These two razor sharp blades can be erected at right angles and, by flashing up against another fish can inflict serious and occasionally fatal injuries. It is

SPOTLIGHT

from these bony blades and their cutting ability that the name Surgeon fishes is derived.

In view of this potential for damage suitable tank-mates for a Powderblue must be chosen with care. Most fishes of similar or larger size will be considered a potential threat and may well be slashed. Small species are much more suitable but these should be lively, competitive types such as damsels, clowns, dwarf groupers and wrasses. These smaller fishes should be acclimatised to their new home for several weeks before the Powderblue is introduced, as the last fish into the tank.

Provided small enough specimens can be obtained most other species of Surgeon fishes can on occasion be kept successfully with Powderblues. But on no account should a Powderblue be housed with either of its two close relatives, *Acanthurus glaucopareius*—the Powderbrown or *Acanthurus achilles*—the Achilles Tang. These two species are found in the Philippines and Hawaii respectively where they fill a similar ecological niche to that utilised by Powderblues in Sri Lanka. They are instantly recognised as competitors and vicious fighting is the usual outcome. There is a further variety, from Indonesia, commonly known as the Powderblack Surgeon, which looks like a dull, sooty *A. glaucopareius*, and this too should be excluded from the Powderblue's tank.

Despite all these do's and don'ts the Powderblue Surgeon is one of the most rewarding of marine-fishes and if treated properly will give several years of pleasure.

PRESS RELEASE

King British Introduce a Moisture Proof Airtight Pack for their Tropical Flake Food

King British are following their policy of continuous improvement in packaging and product where possible, have brought to the market a very attractive pack for their Tropical Flake.

Over the past 18 months King British have been carrying out intensive research, with the co-operation of professional aquarists throughout Europe, into improving their already high quality Flake Fish Food.

The result is an even more acceptable and easily digestable, larger floating flake, with an exacting specification that more than matches other flake foods on the market.

King British use all natural ingredients to satisfy the fishes appetite, whilst providing all necessary minerals and vitamins required to promote healthy colourful fishes.

To coincide with this improved product, a new pack has been developed, in the form of a moisture proof airtight container. The new container is fitted with a ring pull top and has a plastic re-sealable cap, complete with a foil lined inner body, pressure sealed to retain the freshness and condition from the moment it is packed right up to the moment you open it. The re-sealable cap maintaining the freshness to the last flake.

The pack is well presented in a distinctive design, bringing a splash of colour to the shelf and includes useful feeding tips on the label itself. The large diameter top, enables users to get their fingers easily into the pack without damaging the contents.

To promote consumer interest and sales in the new pack, King British have produced a unique token in the form of a coin, valued at 25p, the token will be found in all other King British Foods, it is redeemable at retailers against King British Tropical Flake.

Stocks are now being distributed to wholesalers and retailers, and should be available at your local store.

Be sure to give this food a try next time you go to your Aquatic Suppliers.

Don't forget, if your fish could choose, they would ask for King British—Why Don't You?

Book Reviews

The Living Aquarium—Freshwater and Marine. *By Peter Hunnam, Annabel Milne and Peter Stebbing.* Published by Ward Lock Ltd., 47, Marylebone Lane, London W1M 6AX @ £15.95.

The publisher claims of this work that ". . . there has not been until now a comprehensive book on the aquarium, discussing and demonstrating its theory and practice, design and construction, hardware and functions and relationships to both natural and human conditions."

Emanating from Nordbok, a Swedish publishing house, this is a large and superbly illustrated book. The seven chapters cover respectively: The Natural Environment; Botany for the Aquarist; Zoology for the Aquarist; The Aquarium Environment; Aquarium Hardware; Setting up an Aquarium, and Aquarium Management.

With the utmost thoroughness the authors set out to unfold the facets of life within all types of natural waters, first detailing the unique properties of water as the primary element which embraces 360 million cubic miles of this planet's bulk. Water's chemical constituents, heat retaining properties and interaction with light from the sun are outlined in fascinating detail with colour photographs and colour drawings of coral reef systems, brackish water environments and swamp, lake and river situations.

In Botany for the Aquarist the reader is appraised of the fact that photosynthesis keeps an amount of energy on earth equivalent to the output of over two thousand million large power stations and without which energy this planet would be lifeless. Plants are dealt with within their families and an indication given in each case of temperature, light and water quality requirements.

The chapter on Zoology leads the reader through from protozoans to fishes and we then come to descriptions of species kept in aquaria with information on their temperaments and general requirements, etc. Illustrations comprise excellent colour photographs beautifully reproduced.

The Aquarium Hardware chapter contains diagrams and instructions for making glass tanks, GRP (Glass-fibre plastic) and CRP (Carbon-reinforced plastic) tanks, concrete tanks, wooden tanks and information about steel tanks and tank linings. Filters, pumps, heaters, etc. and tank insulation are covered in detail along with water purification and disinfection and lighting.

Aquarium designs, siting, access for servicing, decorating and furnishing and use of both natural and artificial materials—all of this with detailed drawings in the section on Setting up the Aquarium.

Finally we have the chapter on Aquarium Management, a facet of fishkeeping often skimped in books on aquaria and especially where diagnosis and treatment of fish ailments is concerned. Not so in this work, however. A chemical titration set is described and its functions for determining pH values, water hardness and measurement of toxic nitrate levels illustrated. While emphasis is laid first upon preventative measure rather than curative ones after infection has become apparent, good coverage is given to diagnosis of ailments and their treatment with an illustrated guide to the setting up of a quarantine aquarium.

Fish collecting in the wild and the techniques and equipment involved finds a place in this book too and completes what has been accurately described as a comprehensive work.

There has been a growing tendency over recent years to produce books of varying dimensions which can be inconvenient for those who favour some uniformity along their bookshelves. Measuring 10 in. × 10 in. this volume could be considered unwieldy but it must be conceded that when in use, the format is appealing.

L.E.P.

THE SPOTTED HEADSTANDERS

By B. Black

DURING the last few months I have been fortunate enough to obtain a few specimens of an unusual headstander that has appeared in recent imports of the relatively common Spotted Headstander, *Chilodus punctatus*, Muller & Troschel 1844. This odd species is scientifically known as *Caenotropus labyrinthicus*, (Kner 1859) and has been dubbed False Headstander by aquarists. It takes a keen eye to tell the difference between these two species as they are almost identical in coloration and body shape when young. In fact, I have seen the larger *Caenotropus labyrinthicus* judged as *Chilodus punctatus* at an Open Show and win the class.

These two genera are sympatric, that is they occur in the same river systems, and are principally found in Guyana, Surinam, French Guiana, and Northern Brazil. Aquarium observations show that *Caenotropus* shoal with *Chilodus punctatus* and adopt their head-down position at an angle of 45 degrees. If the false headstander is kept solely with its own species, then its head-down position is not as pronounced, only a 15 degree angle. This curious behaviour could be a defence mechanism and if this is the case then *Caenotropus* would be a *mimic* of *Chilodus punctatus*. It can be seen from imports that the false headstander is much rarer in the wild than the spotted headstander, and so mimicry would prove a great benefit to the survival of this species. Juvenile *Caenotropus* have only been imported with juvenile *Chilodus punctatus* whereas adult *Caenotropus* alone have been. This does suggest that the juveniles adopt this more acute angle of swimming and shoal with *Chilodus* seeking safety in numbers. When the *Caenotropus* are larger than the *Chilodus* they then leave to form their own shoals. Large fish in a shoal of small ones would be a target for predators.

Principal differences between *Chilodus* and *Caenotropus*.

Chilodus

Cycloid scales
Pharyngeal teeth rather small and numerous
Predorsal and postventral keeled
Mouth superior, upper and lower lip thick
Anal rays 13 with a straight border
Maximum size: 120 mm.
Swims at 45 degrees

Caenotropus

Crenulate scales (in adults)
Pharyngeal teeth large but few
Predorsal rounded (except just before dorsal fin), postventral rounded
Mouth inferior, upper lip only thick.
Anal rays 10 or 11 with a concave border
Maximum size: 185 mm.
Swims at 15 degrees

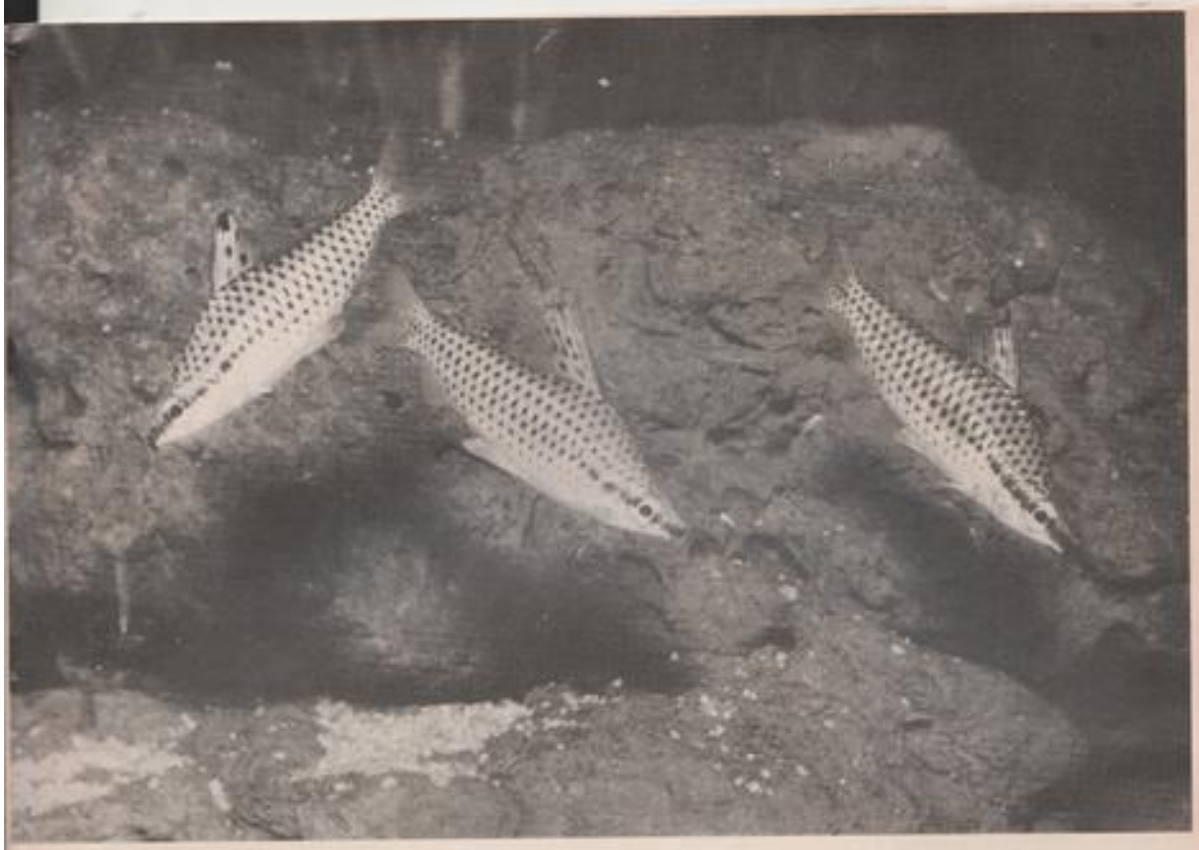
Species

C. *punctatus*. Muller & Troschel 1844
C. *zunevei*. Puyo 1945 (doubtful species/type material lost)
C. *maculosus*. (Eigenmann 1912)
C. *labyrinthicus*. (Kner 1859)
C. *labyrinthicus rupununi*. (Fowler 1914). (doubtful subspecies)

Nomenclature of the subfamily Chilodinae

The genus *Chilodus* is monotypic, that is having only one species, *Chilodus punctatus*. This was the first headstander to be described in 1844 by Muller and Troschel. It has since become a very popular addition to the aquarist's community tank. This species does have two other regional variations, the difference being in their body shape and colour. *Chilodus zunevei* described by Puyo in 1945 from the Litani river, French Guiana, differs in having a greater body depth (2.5 in S.I. as compared to 2.8—3.0 in S.L. in *C. punctatus*). Unfortunately, the type specimens have been lost and no further collections have revealed any. This means that it could be a distinct species or just a sub-species. Until new material is collected or the type specimens found, little can be done to justify its status. A further regional variation was discovered by Harald Schultz in 1960 in the Rio Japura, Upper Solimoes, which has the same morphological characteristics as *C. punctatus* but possesses a very distinct longitudinal band similar to that of *Caenotropus labyrinthicus*. This variation has not been described as a subspecies or species as the differences are not sufficient to merit distinction.

The nomenclature of the genus *Caenotropus* is much more complicated than the previous genus. There are two species, *Caenotropus maculosus* and *C. labyrynthicus* with a dubious subspecies *C. l. rupununi*. In 1859 Kner described a fish as *Microdus labyrynthicus*. Unfortunately, the name *Microdus* had been used two years earlier, (a homonym), to describe a fossil tooth by Emmons. The name *Caenotropus* was therefore suggested by Gunther in his monumental Catalogue of the Fishes in the British Museum, Vol. 5 P.297 1864. Alas, Gunther also thought *Chilodus* to be a homonym and that the two species, *labyrinthicus* and *punctatus*, were scarcely separable, so he placed them



Chilodus punctatus

together in his new genus *Caenotropus* without stating which was the type species.

In 1910 Eigenmann designated *labyrinthicus* as the type species *Caenotropus* and retained the genus *Chilodus* with type species *punctatus*, as *Chilodus* was found not to be a homonym. According to J. Gery (T.F.H. 1964), some authors; Fowler, L. P. Schultz, H. Travassos; believe *Caenotropus* to be invalid and synonymus with *Chilodus* due to the fact that Gunther considered *Chilodus* and *Microdus* as a single genus so the type species would be the elder *punctatus*. Therefore *punctatus* being the type species of the valid genus *Chilodus* would make *Caenotropus* invalid. J. Gery and G. J. Hoedemann in 1962 submitted a proposal to the International Commission of Zoological Nomenclature to retain *Caenotropus* because the type species was correctly designated in 1910 by Carl Eigenmann, being the first revisor.

A further genus was described by C. Eigenmann in 1912 for a head stander collected in British Guiana. *Tylobronchus maculosus* was said to differ from *Caenotropus* by having teeth on both the jaws rather than only on the upper jaw in *Caenotropus*. This character was later decided not important enough to warrant a separate genus and so *maculosus* was placed in the genus *Caenotropus* along with *labyrinthicus*. If the generic name is ever invalidated then *Tylobronchus* would be an adequate substitute.

The last species to be dealt with here was collected by Mr J. Ogilvie in the Rupununi river, British Guiana in 1912 and described in 1914 by Henry W. Fowler as *Chilodus labyrinthicus rupununi*. Later this was placed in *Caenotropus*. This fish is, like *Chilodus zunevei*, of doubtful status and is probably only a colour variation but if it does prove to be valid then it will be the only link between the two species of *Caenotropus*. *C. labyrinthicus* does not live with *C. maculosus* (assympatric) whereas *C. l. rupununi* does live with *C. maculosus* (sympatric). It can be distinguished from the nominal species by the absence of a humeral spot, an interrupted longitudinal band near the head, and a dark bar across the dorsal rays.

Aquarium observations

The spotted headstanders occur in most of the smaller streams in northern Brazil, Guianas except for the limited distribution of the *Caenotropus* species. They prefer soft, slightly acidic waters that are well oxygenated and clear with a great amount of plant growth. The aquarium should be relatively large for these fish as they are fast movers, especially the larger species. An efficient filtration system should be

The Spotted Headstanders

used, either a good undergravel filter with a high turnover or a power filter. The latter is preferable so that a good plant growth can be maintained and one of the proprietary nitrite absorbing materials can be used. Nitrites are very harmful to fish in large concentrations, even small amounts put stress on them. Feeding the headstanders poses no problems although they do require vegetable material ie. lettuce, dandelion leaves or peas, and live foods ie. *daphnia*, bloodworms and glassworms are ideal along with a basic staple food. Fine leaved plants such as *Ambulia*, *Cabomba* and Java moss seem to suit these fish very well and the presence of some bogwood would help to keep the p.H. low (6.0-6.5). Spotted headstanders can be kept with other South American fish as they are very peaceful towards other species. The only aggressive behaviour is between the headstanders themselves. Males will usually fight for resting places and to impress females, usually making clicking noises at the same time. One special requirement for the *Caenotropus* species is a sand covered tank bottom. This is important because they have downturned mouths with which they pick up the sand, sieve through it for food, then spit it out. If sand is not used then searching through gravel could lead to damaged mouths and a shortage of food.

To date only the common spotted headstander has been spawned and then only infrequently. Only recently have tank bred Singapore fish been imported but these small individuals are of a poor quality. The first reported spawning was by Feigs in 1955 and a further detailed account was reported by Geisler in 1959 (T.F.H. 8/59). A small tank can be used and arranged with a few good bunches of Cabomba or Java moss. The water should be slightly acidic and soft with a temperature of 82°F. Filtration and aeration can be provided by one of the better quality sponge filters and livefoods offered in preference to dried foods. Several males and females can be introduced into the tank so as to let the fish choose their own partners but care must be taken in case the others eat the eggs. To avoid this the bottom should be covered with some sort of spawning material, either Java moss or nylon wool. Geisler also noted that the parents spawn close to the surface under floating plants and that the eggs are not adhesive. The danger being that the other fish might eat the eggs as they fall to the bottom. The spawning parents also take on a different colour pattern losing the horizontal stripe and developing a shoulder spot and a dark anal fin. Headstanders spawn in the typical characin style, the male driving the female around the tank and then stopping, quivering side by side as she expels a few of her eggs and he fertilizing them. After spawning, which can last up to two hours, the parents and any other headstanders must be removed. The eggs are clear and about 2.5 mm in diameter. Hatching takes place three days later at a temperature of 82°F., the young being very small must be fed rotifers for the first 4 days then newly hatched brine shrimp and powdered food. The head down position is even more accentuated in the fry as they swim at 90 degrees, perpendicular. The familiar coloration does not develop until the youngsters are about 15 mm long. Hopefully I should have a pair of the false headstanders maturing and will attempt to breed them in a similar way. If the young of *Caenotropus* behave in an identical manner then it could prove the case of mimicry.

As a postscript to this article, the strange specialisation of the false headstander is apparent in another subfamily of South American Characins, the Hemiodinae. The members of the genus *Bivibranchia* have protractile mouths similar to the *Caenotropus* species which enables them to suck in and sift the sand for food. The *Bivibranchia* are also larger, have the same colour pattern and the same body shape as their counterparts, the *Hemiodopsis* species. No behaviour patterns have been observed, so no one can say whether it is a mimic or not. The Hemiodinae and Chilodinae both inhabit the same areas and habitat, and it is wonderful to see how each has evolved a genus to fill a specific ecological niche. This is the miracle of evolution.

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Coldwater Queries

by Arthur Boarder

READERS SERVICE

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

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

I have bred the British species of Newts and would now like to try breeding Alpine newts. Can you please tell me where I can get some?

I am sending you the address of a firm which deals in reptiles and amphibians and although I cannot say whether they have any in stock at the moment, I feel sure that they will be able to get some for you.

Can you send me some information on keeping freshwater fishes in ponds and tanks as there are no shops near here which stock anything in that line?

To send you all the information necessary for the successful keeping of coldwater fishes would take the contents of a book, and so is quite impossible to include this in a letter. My book, 'Coldwater Fishkeeping' will give you all the information you need on constructing pond and tank, setting-up, water plants and fishes, also maintenance, feeding and breeding. There is also a chapter on Pests and Diseases and even one on exhibiting fishes. I am enclosing an address in Ireland where you should be able to get all you require for the hobby.

I am about to start keeping fancy goldfish and have your book so that I can make a good start. However, I would like an address from where I can get good quality fishes of the fancy type?

I am enclosing an address from where you can get the type of fishes you require. However, I cannot state the price you may have to pay as so much depends on the variety and quality. It does not appear to be realised by many aquarists who are just starting in the hobby that fancy goldfish do not turn out like peas in a pod. In a spawning of even the best pair of fancy goldfish their progeny will vary considerably. Many may not even be worth the food they eat and only a very few are likely to make show specimens. You can therefore realise that an enormous difference in price can be paid for various fishes from the same spawning.

After keeping tropicals for a couple of years I have decided to keep Bitterling. I have a tank, 24 × 12 × 12 inches and wonder how many fishes I can keep in it? Also where do they come from and what conditions do they need? Where can I find freshwater mussels for their breeding purposes and how can I tell male from female?

The Bitterling, *Rhodeus sericeus*, is found in many fresh waters of Central and Eastern Europe and Asia Minor. It has been introduced into some British waters, probably by aquarists, and appears to breed in such conditions. It is not a fussy fish and will take both dried and live foods. However it is a small fish and at first dried foods should be soaked before feeding to the fishes. They are very fond of insects, small garden worms and broken maggots. Your tank could hold a dozen fishes but if you intend to try to breed it is not wise to have more than a couple of pairs. When ready to spawn the female will develop a tube from the vent which is inserted in a mussel to deposit the eggs. You may find mussels in ponds and canals and in clear water you will be able to see the tracks made in the mud as the mussels move about.

I have found that my Sunfish do not appear to eat flake foods and would like to know what they require?

Sunfish are very like our Perch in their feeding habits and so are mainly carnivorous. Garden worms are about the best food you can give them and if you chop up one or two and then incorporate a little flake food with it, you will find that the fishes will eat this alright and you can increase the amount of dried food gradually, but it is wise to continue to feed with live foods or strips of meat.

Can you tell me where I can get yellow goldfish, comets and fantails similar to those on page 22 of your book 'Coldwater Fishkeeping', as no shops I have found stock them?

I think the colour of the fishes depicted is pale gold more than yellow. Also it is a known fact among exhibitors that if a deeply coloured fish is taken from a pond and put in a glass tank, the colour immediately fades. This is also noticeable with green Tench when put in an exhibitors tank with no shading. However, the depth of colour in goldfish can vary from deep gold or red to pale gold and many are white or gold and white. By looking around you may find the fish you need but remember that many will turn darker in colour when in a pond.

WHAT IS YOUR OPINION?

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

THOSE INTERESTED in the life span of the Woolworth's clear, 40 watt, tungsten bulbs that I have been using in all my tanks of late may wish to add two more figures to their list. One bulb lasted for 145 days and the other for 126 days. Last week I tried to buy another couple of the special packs of four bulbs at my local branch of Woolworth's but I discovered that there were no more packs of clear 40 watt bulbs in stock; however, I managed to buy two packs of pearl bulbs at the special price. I asked about packs of clear bulbs and formed the conclusion that the special pack offer had ended; or perhaps my local branch just doesn't have any more packs in stock. I had a glance round yesterday and noted that there were no special packs at all on display.

I made a quick trip round a number of shops and stores to compare bulb prices—and I was amazed by the differences in price. Does it cost any more to manufacture higher wattage bulbs—or aquarium heater/thermostat units, for that matter? I was pleased to find another chain store selling bulbs—a well-known brand, in packs of two—at exactly the same price as Woolworth's i.e. two packs of two cost the same as one pack of four. Only pearl bulbs are available in the special packs.

Before fitting the pearl bulbs into my aquarium hoods I hold the bulbs up to the light and peer in from the metal end caps. I carefully note the position of the positive and negative wire terminals inside each bulb and fit the bulb into the holder so that these face the top of the hood, i.e. so that the filament obtains maximum support—although such bulbs are obviously designed to operate vertically rather than horizontally. Four-plus months' life in an aquarium hood from an ordinary bulb costing less than 25p seems good value to me. I should be pleased to hear from anyone else who has been evaluating tungsten bulbs used in aquarium hoods.

An amphibian that interests me is the axolotl (pronounced aksolot'l). If you have kept this strange looking creature please send me details of your experiences.

Mr. John McCadden resides at 29 Wildbrook Road, Little Hulton, Worsley, Lancs. He has kept fish from an early age—including tropicals for the past four years. He says: **"I write in reference to your query, in the November 1981 issue, regarding tortoises. On 2nd May 1981 I purchased a female spur-thighed tortoise —*Testudo graeca*. She didn't eat for some time due to the low temperatures at that time, and the change of climate. After a month, though, she had built up a good appetite, consuming the equivalent of about one complete lettuce each day.**

"Bright sunshine on the morning of Sunday 2nd August prompted her to start digging a hole in the garden. I was over-joyed and thankful that she had chosen a Sunday because I wouldn't miss anything. She commenced at 11.10 a.m. using just her hind legs; and with a little help from me, removing the odd, awkward stone, she was satisfied with the excavation by 1.00 p.m. It was a round, 5in.-deep hole, about 6in. × 4in. across. She had a short rest and then, at 1.04 p.m., laid a white egg, about 1½in. long and nearly round. She laid another five at the rate of one a minute. Each was slightly smaller than the previous one. They resembled pigeon eggs, with the same hard shell; not leathery as I expected.

"I removed each egg as it was laid and placed the lot in a small aquarium with 2in. of sand in it—which I had prepared while she was digging. I took care to keep them the same way up as that in which they were laid. My reference book stated they should never be turned. She had a short rest again, then filled in the hole and expertly flattened the soil over it. After that she always stopped a while at the same spot whenever she was passing. I knew that some or all of the six eggs could well be infertile; but tortoises can lay fertile eggs three or four years after a single mating, sometimes at one or two monthly intervals; so I had to have a go at hatching them.

"I transferred the tank to the bedroom, then covered the eggs with more sand, slightly damp, to a depth of 2 in. above them. I rigged up a 25 watt red bulb to keep the surface at a constant 80°F day and night, going by the book all the time. Peat can be used but dry sand has been successful. However, I sprayed it lightly about once a week. I was patient for six weeks—incubation varies from eight to 21 weeks in different books—then on 15th September I carefully uncovered one—keeping it the same way up all the time—and held it up in front of a bright light bulb. I could clearly see that the yolk had dried, sunk to the bottom and stuck to the inside of the shell. Examination of the other five showed the same dehydrated condition. One actually rattled.

"Perhaps some of your readers could tell me where I went wrong because even if the eggs were infertile

they shouldn't have dried up so quickly. Still, I hope for another clutch of eggs next year—my tortoise is hibernating now—and will keep you informed of any further positive developments. Keep up the good work!"

Corydoras paleatus catfish prompted Mr. D. Brooks, of 60 Maes Talcen, Brackla, Bridgend, Mid-Glam., to write: "I wish to reply to your request for notes on breeding catfish of the *Corydoras* genus. My success was with *C. paleatus*. I am a firm believer that all community tanks should house at least three of these very interesting fish; not to be kept as just scavangers but as an integral part of the community to provide a balance of top, middle and bottom swimmers. They should be fed and looked after just as carefully as any other fish, not left to feed in the remains of other fishes' meals.

"As far as breeding *C. paleatus* is concerned, the first thing is to get a shoal of five or six making sure they are a mixture of males and females. Determining the sex is not too difficult with adult specimens in good health. There are three ways to do this. (1) The females, if ready to spawn, are much broader and plumper than the males. (2) The top fin of the male is usually longer and straighter than that of the female. (3) With a shoal of five or six fish watch closely and in the breeding season—October to March—the males start pecking at the backs of the females.

"By this time the shoal should be in a tank of their own. I have found that a 24 in. × 8 in. × 8 in. tank is quite sufficient. The tank should have a layer of very fine gravel and be planted with low-growing plants. I believe that the best type of filter for this type of aquarium is a small, sponge type which will not trap the fry when they hatch; in fact, they tend to feed on it.

"Condition the fish by changing about 25% of the water at least twice a week using water direct from the tap—the water here is relatively soft. Feed on live foods, e.g. white worms, and some green food; I use shelled, squashed and cooked peas. This conditioning usually does the trick within two or three weeks when eggs can be seen scattered all over the glass sides of the tank. At this stage the fish can be moved back to their original quarters because, as I know to my cost, they will eat the eggs.

"The breeding tank is kept at a steady 78°F and I have found it unnecessary to use any medicament to stop the eggs from fungussing. A few will obviously go bad but they do not normally affect any others even if they are in contact.

"Between three and five days the eggs will hatch; but the chances are that very few fry will be seen until about day nine when they become free-swimming, and at which stage feeding should be begun. First foods can be powdered food and newly-hatched brine shrimps, but make certain no salt gets into the breeding tank. From this point, do regular water changes, and as the fish grow set up another tank and split the spawning in half. Within three to four months you should have about 100 babies of ½-1 in. long.

"I would like to try *C. hastatus* next. I have three, but six would be better; and I cannot find any anywhere. At present I am also mollycoddling a batch of Siamese fighter fry which are nearly three weeks old. With any luck the critical stage for these fry is just about over."

It might help some readers to know that *Corydoras paleatus* is the peppered Corydoras and *C. hastatus* the dwarf or pigmy Corydoras. I should be pleased to receive details from anyone else who has bred catfish.

No. 855 Woodpark Way S.W., Calgary, Alberta, Canada T2W 2V7, is the address that heads the letter I received from Mr. Martin Cain—who, most interestingly, writes the date as 81.11.20. His air mail letter travelled to the headquarters of *The Aquarist* at Brentford, and, hence, to my home in N. Ireland by first class post, to arrive on 81.11.27. Well done, G.P.O. Mr. Cain writes: "You will be pleased to learn this is not a letter about liver flukes, editorial style or your abilities as a journalist. Your column appeals to most readers because you refrain from belittling the letters sent to you, even when you feel yourself at odds with their content. I enjoy both the letters and your interesting comments as they usually cause me to reflect on my experiences in the same area.

"For example, I was very interested to note your observations on incandescent and fluorescent lighting as it affects plant growth in your aquariums. Some 25 years ago, when I first started keeping tropical fish, all my tanks were illuminated by incandescent bulbs. My plants flourished and I did not have a great deal of difficulty with algae. A few years later I converted a few of the aquarium reflectors to fluorescent light, both 'warm white' and 'Gro-Lux' tubes. Except for *Aponogeton* species, none of my plants grew very well under the new regime and I also began to experience problems with algal blooms, particularly the blue-green type. Since then I have returned to using incandescent bulbs in all the tanks and the plants are growing very well. I have also experimented with the clear versus the frosted incandescent bulbs but as yet have not detected any difference in their effect on plant growth. However, I have noticed somewhat better plant growth when the light shines directly into the water, rather than through a cover glass. This has a distinct disadvantage when large, boisterous fish are housed as they will sometimes splash drops of water against the hot bulb, causing it to shatter and fall into the tank.

"In addition to lighting, I have also been experimenting with various types of freeze-dried fish foods and the results have been rather encouraging. My pair of *Pantodon buchholtzi* have learned to accept both freeze-dried plankton and brine shrimps. This

Air stone in with a wide variety of flourishing tropical plants

makes their maintenance much easier as I no longer have to culture large numbers of wingless fruit flies. *Badis badis* will learn to eat freeze-dried *Tubifex*, as will several of the spiny eels—*Mastocembalus*—once the food has become waterlogged.

"You expressed an interest in some of the more unusual species of fish kept by readers and I would like to relate some observations on three species of *Betta* I have recently had the opportunity to maintain.

"The first of these is *Betta coccina*, a beautiful little fish from east central Sumatra and first described by Viecke in 1979. Structurally, *B. coccina* looks very much like a slender version of *B. splendens*, but there the resemblance ends. The body and fins are a deep wine red, the fins being edged with pale blue to blue-white. A large, oval-shaped, emerald spot decorates the flank and the iris of the eye is tinted a beautiful turquoise blue. *B. coccina* is relatively peaceful, the males engaging in their displays but seldom doing any actual fighting. They are bubble-nesters and spawn in typical anabantoid fashion. While I managed to spawn them on one occasion, the fry proved to be very difficult to raise, and eventually they succumbed to an infestation of velvet.

"Another species imported in mid 1980 was *Betta pugnax*, a large and heavy-bodied fish from Malaysia. Despite their 5in. length they remain very peaceful, the males only occasionally challenging each other. *B. pugnax* is not a highly coloured fish but the combination of blue highlights on the flanks and the long, graceful fins is very attractive. Unlike many anabantoids, *B. pugnax* is a mouthbrooder, the male incubating the rather large eggs for a period of 15 to 20 days. The large fry can easily accept newly-hatched brine shrimps and grow rapidly if fed a variety of foods.

"About two months ago I contacted another aquarist who had been successfully spawning *Betta picta*—*B. pictum* in some works—and I was able to trade some of my surplus *B. pugnax* for a few *B. picta*. A much smaller species, *B. picta* achieves a maximum length of only 2in. and is not particularly colourful, even when sexually aroused. Like *B. pugnax*, this fish is a paternal mouthbrooder and while my fish have spawned several times, the male refuses to carry the eggs full term. However, I remain hopeful he will eventually decide to be a good father.

"All these species are accomplished jumpers and this tendency is very strong when the fish are just introduced to an aquarium. A cover glass is an absolute necessity and I have found a thick layer of floating plants will curb their desire to jump. I had better close at this point but I want to wish you continued success with your column.

I hope I have printed the proper names of your fish correctly, Mr. Cain, some are so 'new' that they don't appear in my ageing reference books. *A Dictionary of Proper and Common Names of Freshwater Fishes*, published by the Federation of British Aquatic Societies, 1976, and edited by my friend Dick Mills lists *Betta picta* as the Javanese fighting fish, *B. pictum* as the Javan mouthbreeding (sic) fighter, *B. pugnax* as the Penang mouthbreeding (sic) fighter, and *B. splendens* as the Siamese fighting fish. It may clarify matters if I point out that *Pantodon buchholtzi* is the butterfly fish.

No. 18 Collier Close, Crook, Co. Durham, is the address that heads the latest letter from Mr. P. D. Roe. He writes:

"Unfortunately my aquatic status has changed since I last wrote as I have just been married and now instead of 23 tanks I have only two 4ft. tanks, two 3ft. tanks and one 2ft. tank. They are all freshwater tropical community tanks except the 2ft. tank, in which I breed livebearers. I used to breed quite a large number of egglayers too but I do not have enough space at present.

"During the last year I have derived all my pleasure from exhibiting my fish throughout the North East at local club open shows and have done quite well with my limited resources. Any fishkeeper who has not visited an open show should go to the first one he gets a chance to visit as he will be surprised by the number of fish on display and the number of fellow aquarists attending. I am also show secretary of Bishop Auckland Aquarist Society and had the great pleasure of helping to arrange their open show last year. Our open show this year will be held in April 1982 and schedules can be obtained from me.

"The reason why all my tanks at the moment are community tanks is that because I have concentrated on showing fish I do not get much time for the attention that special groups of fish require. In my tanks is a large variety of the more common livebearers; but I also have one or two rare livebearers. All are breeding. I also have a very wide assortment of egglayers from the barb, rasbora, danio, cichlid, characin and shark families.

"My favourite egglaying fish at the moment is a 6in. red-tailed black shark which I have had for two years and is a really magnificent specimen. My best livebearers are some *Limia perugiae*. I bought two males of this species at a local dealer's, but I was unable to get any females; but fortunately I was able to get some at the British Aquarist Festival so I hope to breed them soon.

"My fish are fed almost every day on live foods which are collected from a local pond. I also feed flake every other day to vary the fish's diet. As I have a large number of catfish, loaches and sharks in my tanks I feed them spinach mixed with Scotch porridge oats each night after switching off the lights. All my tanks are lit by Gro-Lux lighting and the plants seem to grow very well. I have all of the more common plants in my tanks as well as a few 'bulb' plants and, of course, the infamous Java moss. My lights are on for 12 hours per day. Recently I introduced some *Elodea crispus* into my tanks and although this plant is usually found in cold water it is growing very well at all temperatures under 75°F.

"Although I have just been married I have been very lucky in that my wife has developed a keen interest in fishkeeping; even the in-laws have now got a tank. Now my wife wants to have a tank of her own but she says she is going to collect her specimens from my tanks. That's what she thinks! Finally, Bishop Auckland Aquarist Society meets fortnightly on Monday nights at 7.30 p.m., at the Wear Valley Hotel, Newgate Street, Bishop Auckland."

A well planted aquarium of *Cryptocoryne*, Indian fern, hairgrass and *Cabomba*

A lush growth of pond plants

Photograph 1 shows an air stone operating in a well-planted tank. Do you use air stones? Photograph 2 shows a lush growth of plants in a garden pond. Drop me a few lines about your pond as it is at present, please. The main plants in Photograph 3 are *Cryptocoryne*, Indian fern, hairgrass and *Cabomba*. Please send me details if you have successfully cultivated any of these species. The marine tank in Photograph 4 sported a strong growth of a green seaweed (alga) when I took the picture some years ago. I should be pleased to hear from readers who have successfully cultivated tropical marine algae (seaweeds) Incidentally, the attractive, marine tank in the picture, belonged to Mr. Douglas Rose, who then lived in north London. I've lost contact with Douglas. Please drop me a postcard if you know Douglas's present address. Perhaps

I should state that the pond in the picture belongs to Freddie and Heather Watson; and the two freshwater, tropical tanks are my own. If you have photographed any of your aquatic plants—indoors or out—I should be pleased to see the photographs. Tonight I tried to photograph a flourishing flowering and fruiting stem on one of my *Aponogeton* plants. In the process I managed to break off the long, trailing stem near the base of the plant. I hope the photographs compensate me for my carelessness. I had hoped to photograph flower, fruit, seed, seedling and young plant in sequence. My carelessness put paid to that. The plant has flowered before so perhaps it'll flower again.

Those following my Woolworth's tungsten bulb saga may be interested to add two more life spans to my collection for 40 watt, clear bulbs: a pleasing 136 days; and a disappointing 64 days. Have you any figures to share with us?

The last of this month's letters reached me from Ewol Haven, 99 Gorsty Hill Road, Rowley Regis, Warley, West Midlands, the address of Mr. John Lowe. In the November issue I recounted the story of a friend and a thick-lipped gourami causing some surprise when it went for a flap round a bedroom floor. Mr. Lowe had a similar experience. He writes: **" . . . Some time ago I purchased a black-tailed piranha—***Pygocentrus piraya.* **It was about 6 in. long. I wondered where to put the new tank, and finally chose our spare room. This room had a lot of furniture in it as well as boxes of odds and ends, and my coldwater set-ups. Eventually I put the tank on an old medicine chest that was only 4 in. from the front of a large chair in the corner of the room. At the side of the chair is a writing bureau. As you can imagine, space was cramped—to say the least.**

"Things went well for some weeks and I named my piranha Churchill. When the time came to do some routine maintenance in the tank I had the idea of using a large, ice cream container to catch and keep Churchill in for a short time. When I put him in the tank the first time he bit two holes, about the size of a 50p piece, in a brand new net. I finished the jobs in the tank and topped up with water; then I gently lowered the container into the water and filled it so that Churchill could swim out into the tank. I made sure that my fingers were well away from the business end of the fish's mouth.

"Suddenly Churchill jumped out of the container and bounced off the front of the chair and slid between the chair and the medicine chest; then he rolled under the chair that had the boxes on its staves. It would have been impossible to move the boxes and furniture quickly. This meant that there was only a depth of about 5 ins. between the boxes and the floor. I could hear Churchill flapping about but could not see him. In panic I dashed into the bathroom, soaked a hand towel and dashed back into the spare room. I had to go down onto my hands and knees to try to put the towel over the fish. Eventually I managed this without loss of fingers. I pulled Churchill out from under the chair and put him quickly back into his tank.

"When I saw him looking at me, face-on, in the centre of the tank, gulping his thanks to me for saving his life, I burst out laughing. He looked like a bedragged Persian cat with all the fluff and carpet pile that had stuck to him. The next morning his body had cleared of fluff and everything was back to normal. I am glad to report that Churchill is still with us. He is healthy, growing and quite happy now.

"I hope that my story will give you and your readers some amusement. My friends and family still pull my leg about this episode."

For a future feature please send me a letter containing your opinions on anything raised in the body of the text; and on any of the following: (a) breeding sharks; (b) motor filters—external and internal; (c) good flake foods; (d) commercial (branded) cures; (e) breeding angels; (f) hatching brine shrimps; (g) prices of fish in your area; (h) your favourite aquarium shops; (i) feeding aquarium plants; and (j) cover glasses and their effect on plant growth. I should also be pleased to hear how you first became interested in the hobby—and at what age. It would be useful if you were to mention your present age as well. I hope you'll take time to write to me.

If you live in London and would like to be considered for a *Meet the Aquarist* feature please send me details, e.g. name, age, address and telephone number. A picture could also be useful. Obviously I'll be unable to guarantee that a particular person will appear in the feature.

I note that someone introduced a number of errors into my pages in the December 1981 issue. One of the more notable appears in the caption under the photograph on page 30. The spelling Lilacopsis would have been very obviously wrong to those who read my *Plant Profile No.* 3, the subject of which was *Lilaeopsis novae-zelandiae.*

Goodbye until the April issue.

Douglas Rose's Marine Aquarium sports a green marine alga (seaweed)

Tropical Queries

by Dr. C. Andrews

Can you give me some information on fish houses and how to construct them?

The best thing I can do is to refer you to one or two books which cover the subject, and then ask you to let me know if you have any specific problems.

"Tropical Fish" by D. McInerny (Foyles, £1·25) and "Fancy Goldfish Culture" by F. Orme (Saiga, about £8·00) both contain chapters on fish houses. You may also find some information in "Making Your Own Aquarium" by J. Hansen (Bell and Hyman, about £6·00) and "Backyard Fish Farming" by P. Bryant *et al.* (Prism Press, about £3·00).

Can you supply me with some information on the chocolate gourami (*Sphaerichthys*)**?**

This is one of the rather more difficult to care for gouramies. You should provide soft, slightly acid water, at a constant temperature around 28°C. The tank should be well planted, with plenty of hiding places. The regular use of Blackwater Extract is probably a good idea. Most chocolate gouramies will only accept live foods at first, although with perseverance you should be able to get yours to accept dried foods.

How long should an aquarium be set-up before any fish are added?

You should set your tank up (with all the equipment running) and leave it for 1-2 weeks before adding any fish. Then you should add a small number of relatively hardy fish (eg barbs) and let them condition the system for a further 2 weeks. A 25-50% water change is probably a good idea, and then the stocking level may be built up to its maximum safe level over 2-3 months. The maximum safe stocking level for a tropical aquarium is about 10 square inches of water surface for each inch of fish (excluding tail fins).

Disease remedies seem rather expensive to buy in pet shops. Can I make up my own?

It is possible for aquarists to make up their own fish remedies, since the recipes do exist in text books. However, this often involves measuring out very small amounts of chemicals, and even slight errors can have disasterous effects on the fish—or not cure the disease at all.

Good quality proprietary brands of remedy are backed by a proven record of research and development, and when you consider the value of a tank full of even "ordinary" community fish, surely £1·50 for a bottle of safe, reliable white-spot remedy is really quite good value? I have sent you a leaflet which contains information on disease diagnosis and control.

Can you simply explain what is meant by "water hardness"?

Water hardness is a measurement of the amount of dissolved salts present in the water—hard water contains large amounts of dissolved salts, soft water contains relatively few. Water hardness can be measured using a reliable test kit, and the results are usually expressed in degrees of German Hardnes (°dH).

The total (or general) water hardness is made up of the carbonate hardness (KH) plus non-carbonate hardness (NKH). In an aquarium the NKH value stays relatively stable whilst the KH value may fluctuate rather more.

Most (though not all!) aquarium fish prefer soft, slightly acid water, with a total hardness below 10°dH. However, you should always check the requirements of your fish in a reliable text book.

Marine Queries

by Graham Cox

At the moment I have a 4ft. × 1ft. × 15in. marine tank, which contains two small damsels, one small mono, one three inch Batfish and a Boxer Shrimp. I intend to transfer these fish (not Boxer) to a 5ft. × 2ft. × 2ft. tank for fish only.

(1) Would you kindly advise me what lighting will be required for this tank?

(2) The 4ft. × 1ft. × 15in. tank I intend to convert to invertebrates. The lighting at present is one 3ft. 30W "Power Twist" plus one 3ft. 30W "Gro-Lux". Is this sufficient as I have no problem with algae growth?

(3) Also, what would be the best temperature for these two tanks?

(1) *Lighting*—At 2ft. vertical depth of water my "golden lighting rule" is 3ft. of fluorescent tube per each square foot of tank water surface area. Since your 5ft. × 2ft. × 2ft. tank (gross gallonage = 125 Imperial gallons = 570 litres) has a surface area of 10 square feet, you would therefore need the following lighting:

Surface area = 10 sq. feet

Lighting = (10 × 3) = 30 *feet* of fluorescent light

Ideally this would boil down to

2 × 48 in. "Gro-Lux" and

6 × 48 in. "Northlight"/"Warm-White"/"Artificial Daylight" etc.

(2) *Lighting a 48 in. × 12 in. × 15 in. invert tank.* Since this tank is only 15 in. vertically deep, you *only* need 2·5 ft. of fluorescent light per each square foot of water surface area, i.e. 4 × 2·5ft. = 10 feet of fluorescent tube. This should be made up of

1 × 36 in. "Gro-Lux" tube

3 × 36 in. "Northlight"/"Artificial Daylight" etc.

Since you only have half this amount of light at present, I can only assume that your tank receives a large amount of natural daylight.

Please remember that *all* fluorescent tubes, no matter what fancy prices you pay for them, only have a useful life of circa 2,000 hours. That is to say that burning them for the recommended 12 hours (minimum) per day, they should be conscientiously replaced every 6 months.

(3) *Ideal temperatures.* Provided that you intend culturing *only* the easily obtainable *Indo-Pacific* species, the most desirable parameters would be temperature = 78°F, S.G. = 1·020 and pH = 8·3. Nitrite should be zero ppm and nitrate should be as near zero as your bank manager will permit.

Since for a long time I am searching for the medicines or any man who can be my tutor and solve my problems. I am having an aquarium for both seawater fishes and tropical freshwater fishes. You see it is my hobby to get colourful fishes from diving in the sea. But within no time it is all dying within my aquarium. Even though I am changing the dirty seawater to clean tapwater every three days it is still dying. I saw some of your medicines and leaflets and books on tropical fresh fishes and seafishes in Qatar where I live and I know they are the best available but I cannot understand which of your medicines I can use to change seafish into my freshwater tank. Is it possible? I shall be thankful for you forever if you please guide me to transfer seafish to freshfish and guide me how the freshfish can live long time.

Firstly, Mr. Hameed, I would like to compliment you on your written English. I wish I could write Arabic

"I cannot understand which of your medicines I can use to change seafish into my freshwater tank".

to this standard. Secondly, I must sadly advise you that someone has been pulling your leg. Owing to the unique difference between the excretory metabolisms of seawater fishes and freshwater fishes there is NO WAY of achieving your dream on a satisfactory long-term basis. Many Britishers found out this fact at enormous personal expense a few years ago. A UK importer bought into the country a magic Japanese product called "AQUARIUM BOTH", which made the amazing claim that, on addition of this wonderful substance to a tropical freshwater aquarium, both coralfishes and tropical freshwater fishes would be happy in the same tank.

The results are spectacular, if somewhat brief—not unlike a badly organised Guy Fawkes party. Please do not

"The results are spectacular, if somewhat brief —not unlike a badly organised Guy Fawkes party".

waste anymore of your precious money and time in pursuing these murderous experiments.

Along with this letter I have sent two leaflets—"How to start a marine aquarium" and "How to start a tropical freshwater aquarium". Stick rigidly to the advice in these two publications and you will make an aquarist yet.

News 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 **North Bucks. A.S.** held their a.g.m. and presentation evening on 10th December. Elected officers were: Chairman, John Maund; treasurer, Helen Morton; show secretary, Jim Irvine; secretary, Leslie Reed (tel: MK 613922). The trophies were presented by the Chairman, to the following: Characin Cup, Mark Irvine; Cichlid Cup, Steve Carr; Home Furnished, John Maund; Committee Cup, Jim Irvine; Teller Cup, Mark Irvine; Knock-out Cup, Jeff Askin; Junior Shield, Mark Irvine; Guppy Cup, Mike Hands; Fish of the year, Mark Irvine; Angel Shield, Tony Cousins; Cory Cup, Jeff Askin; Irvine Trophy, Mike Hands; Breeder Trophy, Jim Irvine. The Club meets on the first Tuesday in every month. New members very welcome, at the Meeting Place, Stacey Bushes, Milton Keynes.

SOUTH EAST

ON 19th January, **South Park Aquatic (Study) Society** held their a.g.m. followed by an open forum. After welcoming two new members the 1981 Committee each gave an account of their individual activities and reported that the Club was in a very strong position for the forthcoming year. Life member John Pollard then took the chair and the following officers were elected for 1982: Chairman, Gerry Herring; secretary, Marguerite Dudley; treasurer, Helen Trim; show secretary, Eric Franklin; assistant show secretary, Mary Franklin; public relations officer, Tony Jacques. The Society specialises in Coldwater Fishkeeping and meets at 8 p.m. on the third Tuesday of every month at the Wimbledon Community Centre, St. George's Road, London S.W.19. New members and visitors always welcome. Full details from Mrs. Marguerite Dudley, 163 South Park Road, Wimbledon, London SW19 8RX. (Tel: 01-540 5662).

THE **East Kent Aquatic Study Group** held their a.g.m. at St. Bart's Church Hall, Herne Bay, on 12th January. In his report the chairman recalled some of the events which had helped to make 1981 such a successful year for the society. These included not only achievements in open and closed shows but exhibitions and social events. He went on to comment on the large increase in membership during the last twelve months and his hopes that this trend would continue. Membership now stands at 75. He concluded by thanking the retiring committee for all their hard work and enthusiasm throughout the year. Perpetual trophies were then presented. Highest Pointed Member, P. Saxby; Best Home Aquarium, G. Neaves; Best Garden Pond, R. Spoore; 1981 Quiz Winner, D. Jane; Chairman's Award, C. J. Bridgeman. Breeders Cups: Tropical Egglayer, B. Marsh; Tropical Livebearer, A. Aspital; Coldwater, R. Matthews.

Then followed the election of the following officers and committee. Chairman, J. Edwards; Secretary/Treasurer, C. J. Bridgeman; committee, A. Aspital, V. Bird, A. Round, P. Saxby, R. Spoore. The secretary's address is: 150 Greenhill Road, Herne Bay, Kent. Meetings are held on second Tuesday of each month.

* * *

AT a meeting of the **British Aquarist Study Society** held at the Great Eastern Hotel, London, the following officers were elected: Chairman, Dr. G. Cust, 40 Canterbury Crescent, Sheffield 10; treasurer, P. Bird, 8 Long Acre Close, Coombe Dingle, Bristol BS9 2RF; secretary, Mrs. M. Williams, 89 Dorchester Road, Leicester LE3 6UJ. There will be a meeting of the Society on Sunday, 9th May, at the Great Eastern Hotel, Liverpool Street, London, commencing at 2 p.m.

* * *

THE **East London Aquarist and Pondkeepers Association** held their a.g.m. at the Cathcrall Hall, Cecil Road, Chadwell Heath, Essex. The officers and committee elected were: President, Mr. F. Vickers; vice-presidents, Mr. R. Dodkins, Mrs. Arnold, Mr. B. Pegg, Mr. F. Taylor; chairman, Roger Campion; vice-chairman, Keith Palmer; general secretary, Rene Boss; treasurer, Mike Courtier; show secretary, Martin Howells; show organiser/equipment officer, John Boss; librarian/editor, Gerry Smith; public relations officer, Fred Simmons; programme secretary, Ken Wrightson; social secretary, Hazel Howells; lay members, Dereck Mills, Andrew Brown; F.R.A.S. delegate, Silvia Brown; Auditors, Mr. and Mrs. Harris. In honour of their past work for the Association Mr. A. and Mrs. P. Harris were given life membership.

* * *

AT the recent a.g.m. of the **Bethnal Green and Independent A.S.** the following committee members were elected: Chairman, Jim Carney; secretary, Peter Riley; treasurer, Mick Wright; show secretary, Leslie Tuck; show manager, Barry Rendell. A full programme of events has been lined up for the coming year, and speakers include Mr. Cyril Brown talking on Killifish, Mr. John Gilbert talking on Corydoras, and Mr. Gary Stenstowe talking on African Cichlids. The Society meets on the 2nd and 4th Tuesday of each month at Wilmot Terrace School, Manor Way, East Ham, and new members will be assured of a very warm welcome.

* * *

Aylesbury and District Fishkeepers Society (Formerly Aylesbury Aquatic Society) held their a.g.m. on 5th February, at the "Hop Pole," Bicester Road, Aylesbury. The following committee were elected: Wilf Dacre (chairman), Nik Mallett (joint secretary), Mrs. Jan Mallett (joint secretary), Brian Adams (treasurer), Dennis Hardy, Nigel Short, Eric Locke. The society meets at 8.00 p.m. on alternate Tuesdays. New Members always welcome. For further Information Please Phone Aylesbury 631198.

Reigate & Redhill A.S. held their a.g.m. on the 4th January. New Committee: Chairman, Alf Gardner (Redhill 66045); secretary, Dick Gush (Redhill 60537); treasurer, Derek Payne (Upper Warlingham 5388); show secretary, Martyn Fewtrell (Horley 6078). For the coming months they are planning for talks, discussions, field visits and, for those interested in a bargain, the annual Bring and Buy (auction) on 24th May. Members of other clubs and in fact, anyone who is interested in aquatic life and the general welfare of their pets will be very welcome to join them at their regular fortnightly meetings, commencing 8.00 p.m. on alternate Mondays, Woodhatch Public Library, Woodhatch, Surrey.

* * *

AT the meeting on 14th January of the **Romford and Beaconstree A.S.** a quiz was set by Terry Waller. The first table show of the year was also held, judged by Terry's wife Margaret, the classes were S, T, Ds and Es. The society meets at St. Augustine's Church Hall, Birbeck Road, Rush Green, Romford, on alternate Thursdays. Visitors are always welcome. For further information contact the Club Secretary: M. Smith, 224 Wood Lane, Elm Park, Hornchurch, Essex RM12 5NH.

* * *

AT the **Southend Leigh and District A.S.** the following members were elected to serve on the committee for 1982: D. Burgen, president; A. Farrow, vice-president; J. Harrison, hon. secretary.

MIDLANDS AND WALES

THE **Stafford A.C.** wish to thank Mr. Bob Potts, of the Cannock & District A.C. for a very interesting and informative talk, entitled "All in a bag of Daphnia."

* * *

THE January meeting of the **Gloucester A.S.** was well attended to hear Mr. T. Johnson, of Bristol, give the first of two talks on the "History of Aquarium Equipment." The first talk covered air pumps, and was supported by a wide range of old and current pumps which the members had demonstrated. This talk also included discussion and demonstration of heating equipment used in aquaria from the early days of the hobby. Results of the table show: 1 (Equal placing), A. Frost and B. King (78 pts.); 3, N. Frost (76); 4, P. King (74). Meetings of the Society are held on the first Tuesday of each month at the Chequers Bridge Centre, Painswick Road, Gloucester, where new members are always welcome.

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AT the A.g.m. of the **Loughborough and District A.S.** the following officers were elected: Chairperson, Paul A. Hughes; secretary, D. Gwynne Harries, 44 Broom Leys Road, Coalville, Leicester; treasurer, Bill Rodger; P.R.O., Paul Commons, 81 Swallowdale, Thringston, Leicester. (Tel: Coalville 221286). The society meets every 2nd and 4th Thursday of the month; its activities and venue being posted in the Underworld, Loughborough. Any new members are more than welcome. All enquiries to the secretary or P.R.O.

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OFFICERS of **Aberdare A.S.**: Chairman, W. George; vice-chairman, R. Roberts; secretary, D. C. Davies (11 Bryn Terrace, Gwendare, Aberdare, Mid-Glam. CF44 8RB); treasurer, Mrs. N. Bruce; show secretary, A. Lilley; assistant show secretary, G. Roberts; minute secretary, Mrs. K. Nelson.

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CHANGE OF ADDRESS

Cardiff City Transport Tropical Fish Society has changed its address. Now 28 Riverside Terrace, Ely, Cardiff CF5 5AR.

CHANGE of Officers at **Leicester A.S.** were as follows: Secretary: Mrs. E. B. Woolley, 20 Southdown Drive, Thurmaston, Leicester LE4 8HS; (Tel: Leicester 694710); show secretary: J. Richards, 26 Hogget Close, Rushey Mead, Leicester; (Tel: Leicester 666314).

NORTH

THE first meeting for the North West region of the **British Discus Association** was held at Samlesbury, Nr. Preston. Members came from Kendal, Bury, Rochdale, Knaresborough, Manchester, Blackpool and Liverpool. The atmosphere was most agreeable as ideas and suggestions were noted to assist with the running of the club. Some reference books along with advertisement literature and B.D.A. badges and articles that can be bought by members were on show. Further meetings will be held every six months. Non-members are also always invited. Contact the secretary, Mr. R. H. Maudsley, 102 Meadow Street, Preston Lancashire. (Tel. Preston 21813).

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Preston and District A.S. had an inter-club meeting between Bridgewater and Blackpool. There was a terrific turn out with a great atmosphere. The meeting was held at the Golden Cross Hotel, Lancaster Road, Preston. Special thanks to Mr. Allen, who added amusement with Quiz and action. The judge was Mr. Robin Standen. Results: Liveberarers: 1, Mr. and Mrs. Slater (Blackpool); 2, J. Cook (Blackpool); 3, L. and M. Buckley (Bridgewater). Barbs: 1, A. and E. Berry (Bridgewater); 2, B. and B. Calow (Bridgewater); 3, S. and P. Spencer (Preston). Characins: 1, A. and E. Berry (Best Fish in Show); 2, B. and B. Calow; 3, P. Slater (Blackpool). A.V. Cichlids: 1, P. Slater; 2, F. Clayton (Preston); 3, D. Mason (Bridgewater). A.V. Catfish: 1, E. and B. Calow; 2, A. and E. Berry; 3, W. Howe (Blackpool). Anabantids: 1, J. Rainford (Preston); 2, A. and E. Berry; 3, Mr. and Mrs. Slater. A.O.V. of Fish: 1, L. and M. Buckley; 2 and 3, A. and E. Berry. Total entries: 63. Show results: 1, Bridgewater (27 pts.); 2, Blackpool (11); 3, Preston (6).

MR. ROBIN MAUDSLEY reports that the recent series of advertisements which appeared in *The Aquarist* on behalf of his association has drawn tremendous response from all parts of the World!

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AT the a.g.m. of **Wyke Show Society** at the 'Rose' public House, Beverley Road, the following committee were elected: chairman, A. Frisby; secretary, Mrs. G. Frisby; Treasurer, J. Stanford; show secretary, L. Gidding; P.R.O., M. Ashton; junior representative, R. Laverick. W.S.S. would like to thank all the lecturers who gave very interesting talks and slide shows during 1981. Meetings are held on the 2nd and 4th thursdays of the month at 7-30 pm in the 'Rose' public House, Beverley Road, Hull. Visitors and new members welcome.

SOME very interesting slide lectures have been seen of late at the **Sandgrounders A.S.** meetings in Southport. On 7th January, Mr. Brian Morris, of the North-West Water Authority, gave an interesting talk on the local water supply, how water is collected in the North-West and how the Authority manages the water supply from reservoir to our taps. During the evening a colour film entitled "Water on Tap" was presented to illustrate the talk. On 21st January, Guy Wren gave a slide show on the Bahamas where he was resident for several years. Aged only 17 years Guy gave a lecture and presented his own colour slides of the exotic marine life to be found on the coral reef around the Bahamas. The pictures were worthy of any professional and should stand him in good stead for a career as a marine biologist. At the time of going to press the Society hopes to welcome Mr. Roy Johnson, Chairman of the FNAS Judges and Standards Committee, for a slide lecture entitled "Fish on the Showbench"—a look at many of the good and not so good fish seen on the Northern showbenches last season. More meetings like these are planned for the coming months, details of which will be available from society secretary Steve Hounon, 81 Radnor Drive, Southport, Merseyside (Tel: Southport 24743).

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AT the December meeting of the **Northern Goldfish and Pondkeepers Society** two of the founder members Mr. Leslie Baxter and Mr. Stanley Taylor, were made Honorary life members. Brian Rothwell and Bill Ramsden, on behalf of the society, presented them with a brass dish in the shape of a common goldfish. Comets were discussed and two members took along some of the young fish, bred by them in 1981. The society now meet on the third Monday of each month at 7.30 p.m. in the Anglers Club. Riston lane off Green Lane, Bolton, Lancashire. The 6th open show will take place on the 7th August at the Sports Centre. Silverwell Street, Bolton. For further details of membership or show please write to the Secretary, Mrs. P. Hodgkinson, 9, Stratford Close, Off Plodder Lane, Farnworth, Bolton, enclosing a stamped addressed envelope.

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Wyke Show Society held their annual presentation night at the 'Rose' Hotel, Beverley Road, Hull, where trophies were presented by Roy Wilton, a member of Hull Society. The winners were: Fish of the year: 1, Mr. and Mrs. Ashton; 2, S. Fenton; 3, L. Gidding. Senior Aquarists of the year: 1, A. Dudding; 2, R. Gee; 3, R. P. Laverick. Ladies: 1, E. Ashton; 2, C. Bibby; 3, G. Frisby. Juniors: 1, R. Laverick; 2, T. Gold; 3, D. Dolton. Junior gaining most cards of the year: R. C. Laverick. Senior gaining most cards of the year, Mr. and Mrs. Ashton. Partnership: 1, Mr. and Mrs. Ashton; 2, Mr. and Mrs. Frisby; 3, Mr. and Mrs. Bibby. Growing on competition: 1, J. Stanford; 2, L. Laverick; 3, C. Vernon and R. C. Laverick. Furnished Aquaria: 1, M. Ashton; 2, M. Smith; 3, R. C. Laverick. Photography: 1, A. Dudding; 2, T. Gibbins; 3, T. Gibbins. Also it was party night where everyone enjoyed themselves.

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THE a.g.m. of **Caer Urfa A.S.** was held on 8th January. Officials elected were: President, B. Risbridger; chairman, A. Spencer; show secretary, J. Taylor; trophy secretary, P. Burr; treasurer, K. Drummond; secretary, P. Barrow, 18 Wood Gate Gardens, Bill Quay, Gateshead, Tyne & Wear NE10 0ST. Change of meeting nights—now held on the first and third Friday of each month at Chuter Ede Comprehensive, School, Galsworthy Road, Biddick Hall Estate, South Shields, commencing 7.45 p.m. Planning also started on their busy summer schedule which includes an exchange visit to their Twinned fish club in Wuppertal, Germany, and an open fish show.

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THERE has been a change of secretary and show secretary of the **Bradford and District A.S.** Mr. A. D. Fisher, 2 Sherborne Road, Idle, Bradford BD10 8LR is the new secretary. The new show secretary is Mr. D. Moorhouse, 28 Dursley Avenue, Heaton, Bradford 9 (Tel: Bradford 42853).

AT the **Bridgewater A.S.** a.g.m. the following committee were elected: Chairman, M. Young; secretary, S. Davies, 15 Burns Road, Little Hulton, Worsley, Lancs. (061-790 2328); treasurer, D. Mason; show secretary, K. Buckley, 1 Seddon Close, Stoneclough, Radcliffe, Manchester. The Society meets every other Tuesday at the "Ravens Arms," off Market Street, Farnworth. They have lectures on all aspects of fishkeeping.

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Stretford and District A.S. held their a.g.m. on 7th January when the following officers were elected: President, S. Davis; chairman, L. Collier; treasurer, I. Gibson; secretary, K. Robinson, 113 Davyhulme Road, Davyhulme, Manchester M31 2BX (061-747 7750); show secretary, B. Barrow; junior representative, Master K. Crook; librarian, Mrs. D. Brightmore. Other committee members elected were I. Brown, L. Evans, Mrs. D. Robinson and D. Brightmore. The Society meet every other Thursday evening at Humphrey Park Community Centre, Stretford at 8 p.m. The schedule for March includes, Killie-Fish and Livebearer show, quiz, slideshow, table show and a lecture by Mr. D. Harrop. Further information please contact the secretary, K. Robinson, 113 Davyhulme Road, Davyhulme, Manchester M31 2BX.

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AT the a.g.m. of **Macclesfield A.S.** the following officers were elected: chairman, A. Goddard; vice-chairman, Mrs. R. Morton; treasurer, Mrs S. Goddard; secretary, R. K. Morton, 69 Nicholson Avenue, Macclesfield SK10 2BZ; show secretary, J. Merriman, 100 Brock Street, Macclesfield, plus five committee members. They would like to bring to the attention of fellow aquarists that meetings are now held in the Churchhill Way Social Club the last Wednesday in each month.

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NAMES and addresses of **Doncaster & District A.S.** committee for 1982 are as follows: Chairman, H. Ackroyd, 17 Ronald Road, Balby, Doncaster. (Tel: 858476); secretary, A. D. Cooke, 85 Crathie Road, Doncaster. (Tel: 62170); treasurer, S. D. Copley, 17 Newbolt Road, Balby, Doncaster. (Tel: 851629); show secretary, G. Flint, 35 Copley Crescent, Scawsby, Doncaster. (Tel: 782694); publicity officer, N. W. Bronyer, 28 Morley Road, Wheatley, Doncaster. (Tel: 22637).

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CHANGE OF SECRETARY

Morley A.S.—Mr. L. Tomlinson, 10 Florence Terrace, Morley, Leeds, West Yorkshire (Tel: 0532 525662).

SCOTLAND

AT the January meeting of **Paisley & District A.S.** the tableshow was 'Pairs of Fish'. Results: Senior League: 1, D. Rotherford (Australian Rainbow); 2, I. McIntyre (Platies). Junior League: 1, A. Paterson (Silver Sharks); 2, R. Brooking (A. Curviceps); 3, A. Findley (Mollies); 4, A. Paterson (Zebra danios). 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.

MARCH

7th March: Keighly Aquarist Society open show at Victoria Hall, Keighly. Benching 12-30 p.m. Schedules from Mrs. P. Robinson, 2 Hope Hill View, Cottingly, Bingley, Yorks.

7th March: Worksop Aquarist and Zoological Society open show at Lady Margaret Hall, Holbeck. Also Bring and Buy Sale. For details ring Worksop 81361.

21st March: Runcorn A.S. annual open show at St. Edwards Church Hall, Ivy Street, Runcorn (same venue as last year). Benching 12 to 2 p.m. Secretary: Mrs. R. Muckle, 23 Adela Road, Runcorn. Run 76099.

21st March: Bedford & District A.S. first open show at the Bunyan Centre, Mile Road, Bedford. Schedules from Alan Hinds, 12 Abbey Road, Bedford, Beds. MK41 9LG. (Tel: Bedford 53905).
23rd March: Stafford A.C. meeting 7.30pm. The speaker to be Mr. Bob Potts of the Cannock & District A.C., giving the second of two talks on the subject "All in a bag of daphnia." Further details from L. F. Lainton, Secretary, Stafford A.S. 280 Sandon Road, Stafford ST16 3HP. (Tel. Stafford 44606).
27th March: Croydon A.S. open show at the Ashburton High School, Shirley Road, Croydon.
27th March: The Croydon A.S. open show with 47 classes available for exhibits, which includes 2 classes for amphibians and reptiles. Secretary: L. S. Derrick, 5 Glenthorne Avenue, Shirley, Croydon CR0 7ET.

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 Rodsley Avenue, Gateshead, Tyne & Wear NE8 4JY.
17th April: Hendon Covention, speaker F. P. 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 Ollerton Road, New Southgate, London N11.
18th April: Bishop Auckland A.S. open show, at Bishop Barrington School, Woodhouse Lane, Bishop Auckland. Auction, trade stands and sidestalls. Benching 12—2 p.m. Schedules from Show Secretary, P. D. Roe, 18 Collier Close, Crook, Co. Durham. Tel: Bishop Auckland 766610.
18th April: Pocklington A.S. first open show at Livestock Centre, Murton, York. Schedules from Show Secretary, R. Slee, 56 George Street, Pocklington, York YO4 2DQ.
18th April: Kettering A.S. annual open show at the Boy's School, Windmill Avenue, Kettering. Show schedules are available from: Mr. C. Wright, 18 Shakespeare Drive, Burton Latimer, Northants. Tel: 053672-3868.
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: Skegness and District A.S. 5th open show, Imperial Cafe, North Parade (opposite Pier), Skegness. 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.
25th April: Skegness & District annual open show.
25th April: Catfish Association of Great Britain, open show, at the Amersham Community Centre, Chiltern Avenue, Amersham on the hill, Buckinghamshire. Details from the Show Secretary T. A. Cruickshanks, 82 Stanley Avenue, Greenford, Middlesex. (Tel. 01-578 0104).
25th April: Yeovil and District A.S. open show, Parish Hall, Marnock, Somerset. Schedules and further information from T. C. Perry, 306 St. Michael's Avenue, Yeovil, Somerset BA21 4NF. (S.a.e. please).
25th April: Merseyside A.S. annual open show at the Rainhill Village Hall, Rainhill, Lancs. Secretary: J. Bailey, 11 Auburn Road, Liverpool L13 8BJ.

MAY

1st May: Southend, Leigh & D.A.S. open show at St. Clements Hall, Leigh-on-Sea, Essex. Details from Show Secretary D. Chewright, 2 Cedar Avenue, Wickford, Essex. (Tel: Wickford 2513).
2nd May: Bimbi Aquarist & Study Society first open show, at Felling Community Centre. Benching 11.30am-1.30pm. Schedules available from: T. Ogden, 134 Balmoral Drive, Felling, Tyne & Wear. (Tel. 0632 699484). s.a.e. please.
2nd May: Hull A.S. open show.
9th May: I & E A.S. open show at Monks Dyke High School, South Lincs.
9th May: Sudbury A.S. 10th annual open show at Neasden High School, Quainton Street, London, N.W.10. Schedules and further information from Barry Witteridge, 150a Preston Road, Wembley, Middx. (Tel: 01-904 0818).
9th May: Throckley A.S. 3rd open show in the Grange centre, Newburn Road, Throckley. Benching 11-30 to 1-30pm. Schedules available later from Show Secretary, Mrs. D. Lakey, 51, Hawley Crescent, Throckley, Newcastle on Tyne. (S.a.e. please). Tel. 6032-677236.
9th May: Macclesfield A.S. open show at Ryles Park County High School. Details can be obtained from show Secretary, Mr. J. Merriman, 100 Brock Street, Macclesfield.
9th 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 Braemar Avenue, Bournemouth, Dorset BH6 4JF. S.a.e. please.
9th May: Sudbury A.S. 10th open show at Neasden High School, Quainton Street, Neasden, N.W.10.
9th May: Corby & District A.S. open show at Corby Civic Centre, Festival Hall. Benching: 10.30-1 p.m. Schedules on request to Alan Henderson, 5 The Nook, Corby, Northants.
15th May: Southern Lovebearers 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, Natty Noble, 58 Woodville Road, Boston, Lincs. PE21 8AP. (Tel: 0205-50458).
23rd May: North Avon A.S. third open show at the Wesley Hall at the junction of Windmere Road, Patchway. (Change of date). Secretary: Mrs. C. Carry, 12 Linnet Close, Patchway, Bristol, Avon.
30th May: North Avon A.S. third open show. The venue for the show will be decided upon at a later date.
30th May: Sutton & District A.S. open show at Sutton County Primary School. Further details from Mr. G. Wilkinson, 25 The Hawthorns, Sutton-in-Craven, Nr. Keighley, West Yorks.

JUNE

6th June: Loughborough and District A.S. annual open show. Show schedules and venue to be announced later.
19th June: South Park Aquatic (study) Society 1982 open show for coldwater fish at the Wimbledon Community Centre, St. Georges Road, London SW19. Further details available from Eric Franklin, show Secretary (S.P.A.S.S.) 105, Hassocks Road, Streatham, London SW16. (Tel. 01-679 2680).
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).
19th June: East Dulwich A.S. special "Silver Jubilee" open show to celebrate the club's 25th birthday, at The United Reformed Church, Highcombe Avenue, Charlton, London SE7. For further information and show schedules: Show Secretary, Mrs. D. L. Winder, 32 Eddystone Road, Brockley, London SE4 2DE.

JULY

10th July: Sandgrounders A.S. 12th annual open show at Meols Cop High School, Meols Cop Road, Southport, Merseyside. Schedules available on receipt of s.a.e. from B. Baldwin, 10 Olive Grove, Southport, Merseyside. (Tel. 0704 43384). 50 Perpetual trophies. New Photograph Contest.

AUGUST

1st August: Leicester A.S. 2nd open show at St. Matthews Community Centre, Malabar Road, Leicester. All enquiries for schedules and information should be made to Show Secretary, J. Richards, 26, Hugget Close, Rushey Mead, Leicester. (Tel. Leics. 666314).
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, Bedminster, Bristol. Benching 9.00 a.m./12.00 (noon). Schedules will be available from mid-June from the Show Secretary, Mr. L. Linleton, 9 Little Stoke Road, Stoke Bishop, Bristol BS9 1HQ. S.a.e. with application please. Show will be to F.B.A.S. rules and incorporate *Aquarist* Gold Pin, Championship Trophy class and Brooch scheme.

SEPTEMBER

5th September: North Wilts A.S. open show, details from Show Secretary, Mr. P. Taylor, 7 Ridgeway Road, Stratton, Swindon, Wilts. (Tel. 0793 824114).

NOVEMBER

14th November: Bradford & District A.S. open show at Clayton Village Hall, Clayton, Bradford. Further information available from the Show Secretary.