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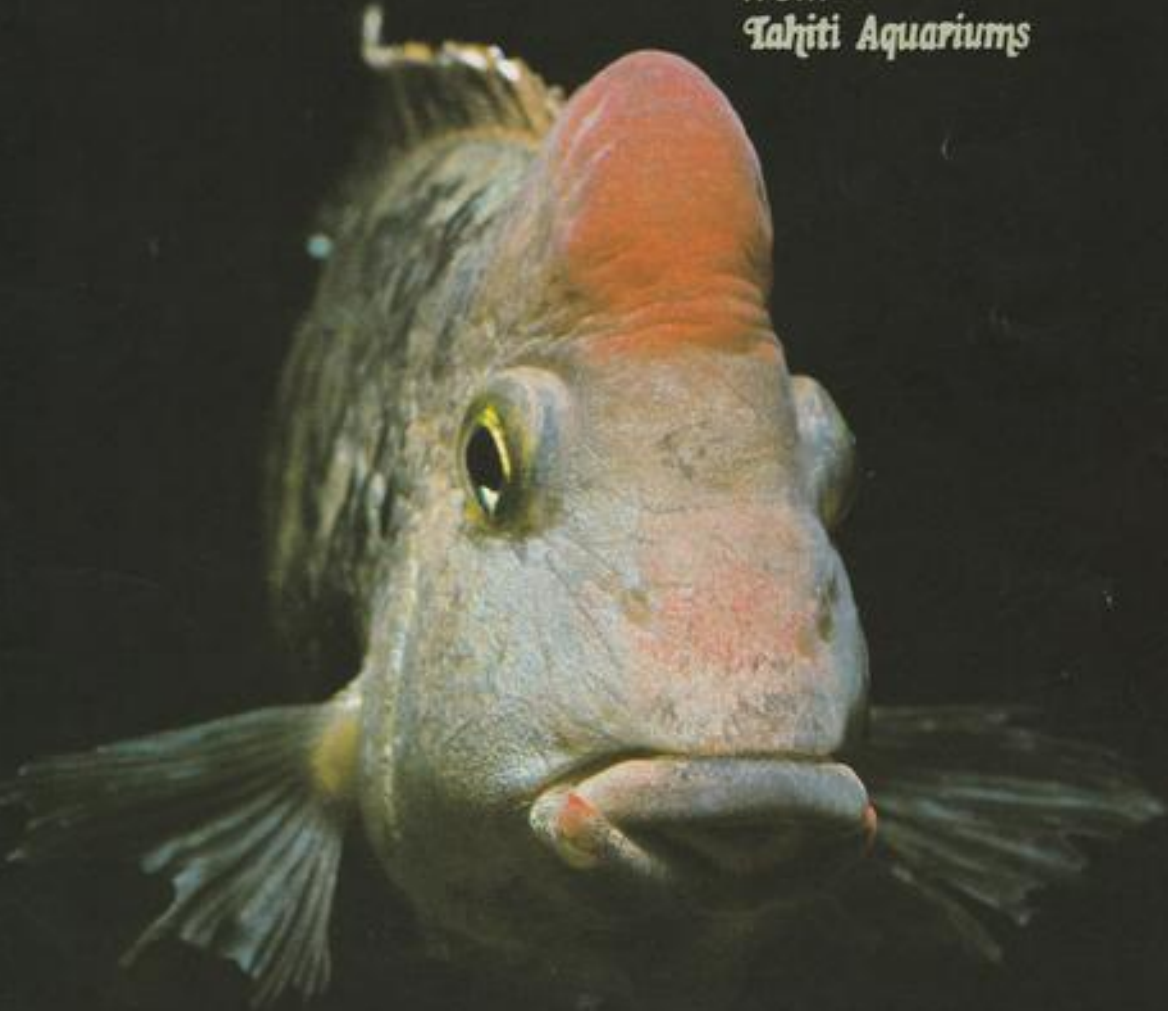
# AQUARIST

AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

**WIN A MARINA TANK,  
STAND AND HOOD -**

from  
*Tahiti Aquariums*



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#### Cover Story

Our front cover this month depicts an impressive *Geophagus steindachneri* male. Commonly known as the Red Hump Geophagus, this interesting species has undergone several name changes, each accompanied by a considerable amount of controversy. *G. steindachneri* is a South American mouthbrooding Cichlid in which the females are responsible for protecting the eggs and (later) the fry. The generic name *Geophagus* means "earth eater" and refers to one of these fishes' most commonly observed behavioural characteristics. In reality, they do not eat earth—they merely take in mouthfuls of substratum which are then spat out after any edible material which they may contain has been removed.

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AND PONDKEEPER

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# THE GOOD, THE BIG AND THE BEAUTIFUL

Allan Thompson extols the virtues  
of the only true Gourami and discounts the size it  
can attain by highlighting its attributes

**C**lear your mind of everything to do with the aquarium hobby; tanks, heaters, pumps, fishes, etc. Now think of a fish which has a most distinctive body shape, with a character to match; add to this the fact that it has an enormous appetite and can grow in excess of 24 inches, (60 cms) in body length and has a body depth, between dorsal and anal fins, of some 14 inches, (35 cms). More clues needed? It is not a cichlid, nor is it a catfish, and it neither comes from Africa nor America; you must have it now! To complete the picture, it is the only 'true' gourami to be found on our planet, and with common names of 'The Gourami', and the 'Giant Gourami' it has to be the one and only *Ophichthys gouramy*.

A magnificent species of fish which wins the admiration from all who have the good fortune to see a specimen, *O. gouramy* boasts a vast history. It is certainly one of the oldest anabantoids; archaeological digs in Sumatra have revealed fossils which are remarkably similar to present day specimens, thus the species has remained relatively unchanged for some 30 million years or so. One question which has always been a little confusing is that concerned with the fish's actual country of origin. It is believed to be a native of the Greater Sunda Islands, in the East Indies. The reason this question is so mystifying is due to present day distri-

bution of the species being now found throughout S.E. Asia, China, Seychelles, and there are reports of it being introduced into France. Why this vast distribution of the species? The answer to this is both simple and logical. If a fish which grows to some 24 ins. (30 cms), has a body weight upwards of 18 lbs (9 Kg), and can be used to keep people nourished, why keep it in one country? This is exactly what fish farmers thought. Therefore this exceedingly useful foodfish has answered the prayers of the native people of these poorer countries, and reports say the flesh is both good eating and that it tastes delicious.

If one ever comes across a juvenile specimen and is contemplating keeping this giant, please bear in mind the size it can grow to. An aquarium which is only two, three or even four feet long can only be used as a temporary home to maintain this species. On no account should a fish of this size remain captive in aquariums of these dimensions. In its natural environment *O. gouramy* swims in open water, therefore space is of utmost importance. Aquaria measuring six feet long, and some eighteen inches in height and depth and preferably larger, are the only water containers suitable. In the wild, these fishes can reach full size in approximately four to five years; in captivity this duration will be far longer unless, of course, you happen to be the proud owner of an indoor heated pool! Whatever the

dimensions of the aquarium you choose, you should provide a heavy and relatively tight fitting cover glass, as the Giant Gourami is an active fish and from time to time, and without hesitation, it will jump, and believe me this fish packs some power. Mother Nature bestowed upon it a hearty appetite and therefore you will appreciate the considerable amount of mess the species will make; regular water changing is a must, so too is an effective filtration system. *O. gouramy*, can tolerate a range of water temperatures from as low as 60°F to



as high as the upper 80's, though it does best at around 78-80°F. Being a swimmer of open water and estuaries, a degree of salt will be bearable; however, this is not a must and is best omitted from the water, unless the fish is ill when a small amount of salt can be of great benefit. As regards decoration in the aquarium, one must consider the fish; plants are out of the question. A two inch specimen does well in a planted aquarium, but as the fish grows so does its taste for green foods. The aquarium bed may be decorated with large rocks or large pieces of bogwood. Although vegetable matter does constitute a large part of its diet, by no means is it solely a vegetarian. *O. goramy* will eat almost all insects and various worms when in its infancy. As the fish grows it will appreciate larger worms, pond pellets, mealworms and unwanted fry and smaller fishes. By the time this giant reaches 10 ins., plant material will be the bulk of its diet along with the numerous pond pellets, unwanted fish and fruit. To hand feed a ten inch *O. goramy* with tangerines and banana is a treat.

The general body shape of *O. goramy* is very distinctive, but there does exist a number of differences between the juvenile and fully grown and matured fish. The young Gourami possesses a pointed snout which, like the body, is a dark olive-grey to olive-brown in colour. This merges into the base of the major fins. A series of similar coloured bars runs vertically along the sides of the

fish, these being separated by a silver-grey colour, which also adorns the throat and underside of the juvenile. The pectorals are clear, the ventral fins being dark at their origins, the long thread-like filament fading to a pale red-brown colour. The dorsal, anal and caudal fins are dark, all being edged with a cream or light colour. A dark spot or ocellus occurs two-thirds down from the posterior end of the dorsal fin. As the young fish grows and matures the barring of the body fades, so too does the ocellus. This gradually takes place when the fish reaches seven or eight inches in length. The major change is that of the head shape. It loses the pointed snout, the head becoming more rounded and characterised by the rather thick, large lips. The colouration of the body is generally much paler than that of the juvenile, with the prominent scales being evenly coloured. The forehead and lips are pink in colour and may be adorned with blotches and dark spots. Some specimens may possess darker body colours, some exhibit brown, cream and gold. There is in existence an albino population, but these are rarely if ever, seen in aquaria.

#### Sexual maturity reached at the age of two to three years

Sexual maturity occurs when *O. goramy* reaches an age of between two and three years. At this time the body may measure between 12 and 16 ins. in length. The sexes are distinguished by the shape of their finnage, the dorsal and anal of the female being more rounded whereas the male's finnage is slightly more elongated and more pointed. In some instances the female may be more robust than her mate; however, to

distinguish the sexes relying purely on this method is not advised, as a male could be, and indeed occasionally is, much fatter than his mate.

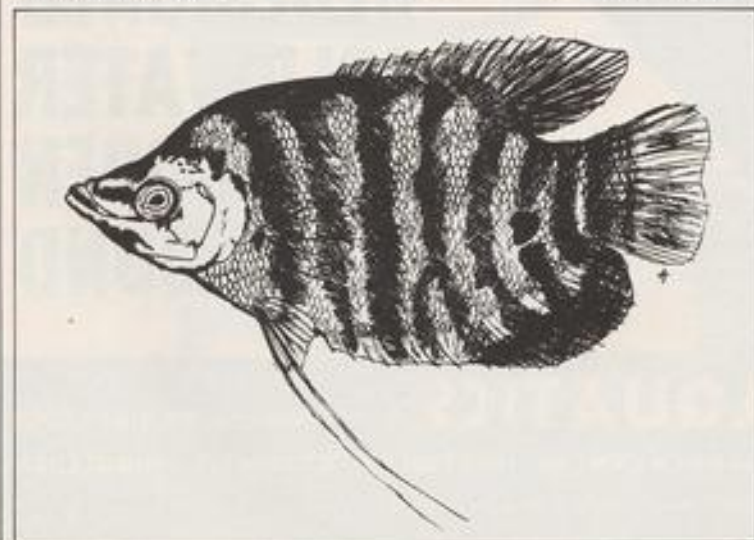
*O. goramy* has been bred in captivity, both in extra-large aquaria and in man made ponds. In their natural environment it appears the rising of the water level in the river during the rainy season triggers off the majority of spawning fishes. In the aquarium, the fishes have to rely on their captors conditioning them for the great occasion. The actual spawning procedure is reminiscent of their smaller cousins though that 'typical' nuptial embrace does not actually occur. This is probably due to the sheer size of the fishes involved. As with the smaller relatives, the male *O. goramy* constructs the nest, or nests (in some instances several nests may be constructed before the fishes are happy), roughly spherical in shape and consisting of masses of plant material, debris and mud, which is 'dug' up from the bed of the river. The size of the nest can vary from 12 ins. to nearly two feet in diameter. During the spawning, the female releases the eggs in close proximity to the nest, the male quickly fertilising them. They may number from as few as 3,000 to as many as 20,000 or more! There exists a small droplet of oil in each of the fertilised eggs and this tends to make the eggs float in doing which they become trapped in the materials of the nest.

The developing eggs may take up to two weeks before becoming totally free-swimming fry; during this time one or both parents will watch over the nest.

By the time the fry reach the free-swimming stage they will measure between  $\frac{1}{2}$  in. and  $\frac{3}{4}$  in. in length and therefore feeding is no cause for worry. In their own country, and countries of distribution, the fish farmers feed the fry with insects, flies, termites, etc. In the aquarium *Daphnia*, Fruit Flies, and adult Brine Shrimp, (*Artemia*), would equal these foods. By the time six weeks have elapsed the young fishes can measure up to 2 or 3 ins. in length, and look more and more like *O. goramy*. They do, of course, inherit their parents' hearty appetite so growth is fairly rapid.

I do hope this article has given you a brief insight to this remarkable fish; like that popular cichlid, the Oscar, (*Astronotus ocellatus*), *O. goramy* can, and indeed will, become very tame. Not only will it enjoy feeding from your hand, it will enjoy its belly being tickled from time to time. Often people come to me and ask how on earth can one say that a fish is a pet; in this case, *O. goramy* is nothing else but a pet.

Below: Young *O. goramy* showing pointed snout and barred markings. Left: Adult specimen with more rounded head, large thick lips and loss of body patterning.



# CORRECT FEEDING

In the final part of his series on the correct approach to fish nutrition, Dr. David Ford suggests some less obvious dietary choices and also offers a few words of warning about live foods

There are many pleasures in fishkeeping—just watching is of proven therapeutic value, but the only participating pleasure is in feeding them. Hence many hobby-

ists want to experiment with different foods or watch the "chase and kill" with live foods. If a basic commercial diet is fed, the fish can be given some supple-

## The golden rules for correct feeding

- 1 Rely on a good quality flake for balanced nutrition.
- 2 If you want to feed variety, choose non-fatty foods.
- 3 Do not use spiced foods.
- 4 Never use live, wild, aquatic food.
- 5 Use cultured live food or living food from a non-aquatic source.
- 6 Little and often is best, but once a day is O.K.
- 7 Feed for three or four minutes, remove any surplus.



mental diet without affecting their nutrition.

Kitchen scraps can be given provided any white fat is removed from meats. Do not forget that processed meats have the fat blended in, so do not use luncheon meat, hamburgers or sausage meat. Choose steak, liver, heart, fish flesh, crab, prawns, shrimps etc. Vegetables are useful for herbivorous fish, especially peas (cooked) and lettuce. To make lettuce leaves more edible, scald with boiling water first. Canned pet food is acceptable—especially the type containing meat in jelly (Bounce, Whiskas, Chum and Mr. Dog). The jelly helps prevent the meat breaking-up. This applies to pondfish, too.

Avoid spicy foods such as Curries and Chinese meals or pickled foods because fish reject them. Practically anything else can be fed—the rule is, if you can eat it, the fish can eat it. Big fish that enjoy chunky food (such as Oscars) will accept anything from cheese to cherries. To ensure these big fish get their vitamins, cut the chunk of food and insert a flake before feeding whole. Another technique is to chew some of your dinner (the Sunday Roast Chicken, potatoes and veg.) into a bolus of food and drop this into the tank.

## Live foods

Do not feed wild live aquatic food i.e. *Tubifex* from rivers, *Daphnia* or Cyclops from ponds and mosquito or other larvae. They are all carriers of parasites and possibly harmful bacteria. Some aquarium shops stock cultured live *Daphnia* and these should be disease-free.

Non aquatic live foods are all acceptable. The red garden earthworm is an ideal food. Flies, grubs, non-hairy caterpillars, greenfly, backfly etc. provided insecticides have not been used.

The very best live foods are cultured ones, so you know they are free of chemicals, parasites or disease. White-worm, Grindal worms, Micro-worms, Fruit-flies can all be bought from aquarium shops or the magazines' advertising section and when cultured as per given instructions, provide a constant supply of living foods. Best of all is the Brine Shrimp, ideal when newly hatched for baby fish, after a few days on cultured *infusoria*.

For more information on live foods see *Encyclopedia of Live Foods* by Charles O. Masters, TFH Publications, 1975, ISBN 0-87666-093-6.

David Ford in the Aquarian laboratory. The top flake manufacturers have sophisticated research facilities for studying fish nutrition.

# THE SUCKING LOACH

How does the 'sucking loach' retain its firm hold against strong currents?

The structure of the mouth is both complicated and fascinating as described by Dr. Michael Benjamin

**T**he sucking loach, *Gyrinocheilus aymonieri* typically lives in the mountain streams of Thailand, but is also found in the calmer waters of the plains and in coastal streams. As aquarists, we know it as the 'sucking loach' or 'Chinese algal eater'. Both are unfortunate names, for it is neither a loach (i.e. a member of the Cobitidae) nor does it come from China! Who thought of these names in the first place? Come on own up!

It is a member of the single genus family, the *Gyrinocheilidae*, that is said by hobby books to have three species, but I'm not sure this is true. There are certainly two species—*G. aymonieri* (that used to be known as *G. haznakhov*) and *G. pustulosus*, the Bornean fish for which the genus was established in 1902. If there is a third species, it is *G. pennocki*, but Smith (1945) in his classic account of Siamese fishes, considers this fish to be synonymous with *G. pustulosus*. Without seeing the fish (named *G. pennocki* by the Ichthyologist, Fowler), it is difficult to comment further. I suppose I'm sceptical because of repeated statements in the scientific literature that begin with something like "Fowler was mistaken in identifying this fish as . . ." or "Fowler was wrong in synonymising . . . with . . ." Anyway, all the aquarist needs to know is that *G. aymonieri* alone is imported to Europe. Not surprisingly, its first introduction to the aquatic trade was in Germany, in 1955.



When the fish is not using its sucker, it folds it neatly under its head

The outstanding characteristic of *Gyrinocheilus*, and one of the main reasons it is placed in its own family, is the dorsal opening above the opercular slit. This is commonly called an 'inhalent pore' and indeed my current opinion is that water does enter here, though the scientific evidence for this needs strengthening. According to the traditional view, water enters the inhalent pore (because its guarding valve gives way to the intruding current), irrigates the gills and exits via the main opercular opening. All this is necessary because the lips form a sucker that stops the animal being washed downstream in torrential waters. The

sucker precludes the normal route of water entry via the mouth.

Besides anchoring the fish to the bottom of a fast-flowing river, the sucker houses the horny rasp that the fish uses to scrape algae from stones. Fortunately, we can study the sucker of *G. aymonieri* in our aquaria, for the fish continue to eat algae here and often hang vertically from tank walls. When large numbers of them are attached together (as you might see in your local shop), they look like clothes pegs on a washing line, for they always hang downwards. If you have the opportunity to compare this position of the non-feeding, attached fish, with that of any 'pleco' (e.g. *Hypostomus plecostomus* or *Ancistrus lancholana*), you will see that plecos do not always hang vertically.

When the sucker of *G. aymonieri* is not used, it is neatly folded under the head so as to streamline the fish. In this 'closed' position, the part of the sucker belonging to the lower lip is collapsed within the larger part that belongs to the upper lip. The collapsed portion straightens out as the sucker is swung open in preparation for use. When the fish is finally attached to the aquarium wall, both lips are turned almost inside out by their contact with the substrate. The outline of the sucker becomes roughly hexagonal. I've numbered the angles of the hexagon on the photo on page 13. Angles 1 and 2 correspond to the position of rods of supporting tissue that spring from one of the bones in the upper jaw

Right: The sucker is swung down in preparation for use. Its hinge is just below the notch on the top of the snout. The inhalant pore (P) is just visible in this photograph.

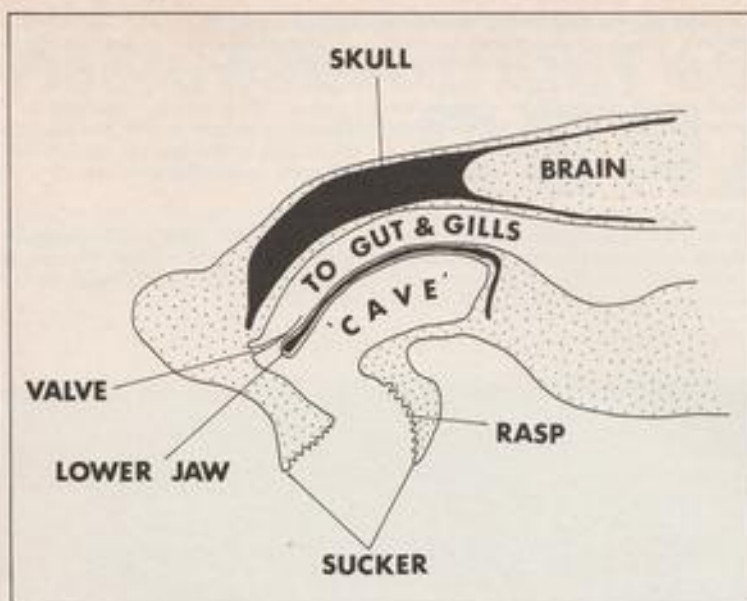
Bottom: A part of the rasp seen in side view with an electron microscope. It is the free edge of these blades that scrapes the algae from your tank.



and end at the sucker margin, angles 4 and 5 result from partial splits in the pliable tissue that supports the lower lip, and angles 3 and 6 are where the two lips meet and where there is a minimum of supporting tissue (hence allowing the lower lip to collapse within the upper). Water is pressed out of the sucker as its rasps touch the glass. The lower jaw is firmly clamped against the underside of a valve near the apex of the sucker funnel and this seals off any continuity of the sucker with the gill openings. As our fish has only a small swim bladder, its body weight tends to enlarge the sucker chamber and create a vacuum. When anchored to a stone on the river bed, it is the force of the flowing water that produces the vacuum. So the sucker is like that on a tank heater, except that here the vacuum is produced by the recoil of elastic walls. It is unlikely that the horny hooks of the rasp help the fish greatly in sticking to glass walls, though the increased friction they create, may be important in mountain streams.

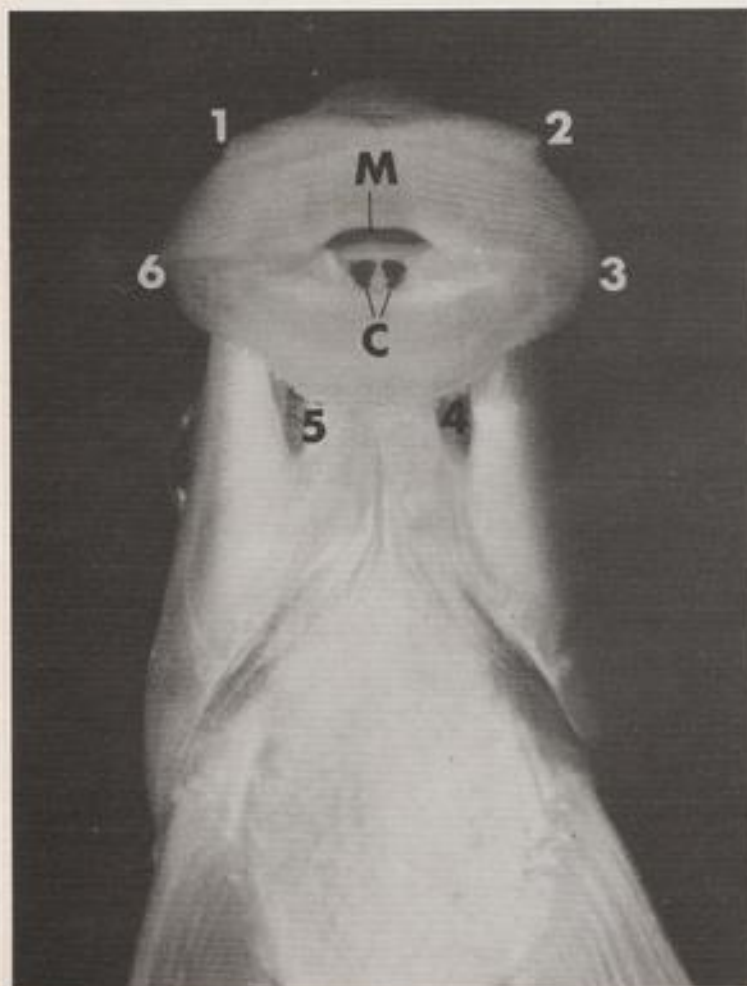
Have you ever noticed the two little pits within the sucker of an attached fish? They are shown in some of the photos and the story behind them is quite remarkable. I don't know of any other fish that has them. They are like the entrances to two caves that lie under the hollow lower jaw, end blindly, and do not connect with each other or with the buccal ('throat') cavity. But as you can see from the drawing, they greatly extend





Left: A drawing of the inner workings of the sucker as seen with an ordinary microscope. The lower jaw is clamped against the mouth valve to isolate the sucker cavity from the 'throat chamber' that leads to the gut and gills. The power of suction is enhanced by the blindly-ending 'caves'.

Bottom: This fish was stuck to the author's tank wall. Its sucker looks enormous and is roughly hexagonal in outline because the lips have spread outwards, squeezing the water from the vacuum chamber. Clearly visible are the two 'caves' (C) and the back opening of the mouth (M). The numbers on the sucker margin are explained in the text.



the capacity of the sucker and thus its ability to produce a vacuum. Further, their volume can probably change by muscle action, so that they can suck in and blow out water, or recently scraped algae.

How can a fish swim free once it has stuck to the glass? Well, it must equate the pressure inside and outside the sucker. Either it breaks the marginal seal, perhaps by a flick of the body or a puff of its water bellows, or the apical seal by moving the lower jaw away from the valve. Your guess is as good as mine!

If what I say is correct—that the sucker of *G. apomieri* can produce a true vacuum, then water cannot enter the mouth of an attached fish and it must find another route. Hence my belief in the inhalent pore. There are a couple of simple observations that support my theory. First, the single valve inside its mouth does not move away from the lower jaw when the fish is attached—at least not for long periods. It would simply have to, if water did seep past it to irrigate the gills. Just a moment's glance at the sucker of any attached pleco will show you this, for its oral valve is continually bailing water backwards. In plecos, it is probably the low pressure induced by a rapidly-flowing water current that allows the animal to stick. Secondly, the fish have difficulty attaching to plastic surface on which closely set grooves have been cut (I took an empty lemonade bottle, put 2 inches of gravel in it and



then made lots of vertical and horizontal score marks about 1 millimetre apart with a Stanley knife). The fish can stick, but their sucker often slips and they keep pressing it back. I think the grooves act as channels that connect the water inside and outside the sucker and prevent it from forming a true vacuum.

Finally, I have a few comments on the algal-scraping device of the sucking loach. It is like a miniature file on those portions of the upper and lower lips that can be turned inside out, but is absent higher in the sucker. It is not formed by true

teeth but of regular rows of horny hooks capped with a tough substance called keratin, similar to that in our finger and toe nails. All the hooks are curved and their cutting edges point towards the mouth so that the newly scraped algae are heading in the right direction. It is very different from the algal-scraping device of certain plecos. Here, there are many long, delicate teeth with forked ends. Such equipment doesn't look strong enough for scraping close to rocks. Perhaps it just tangles up the longer algal filaments and tears them off—but I

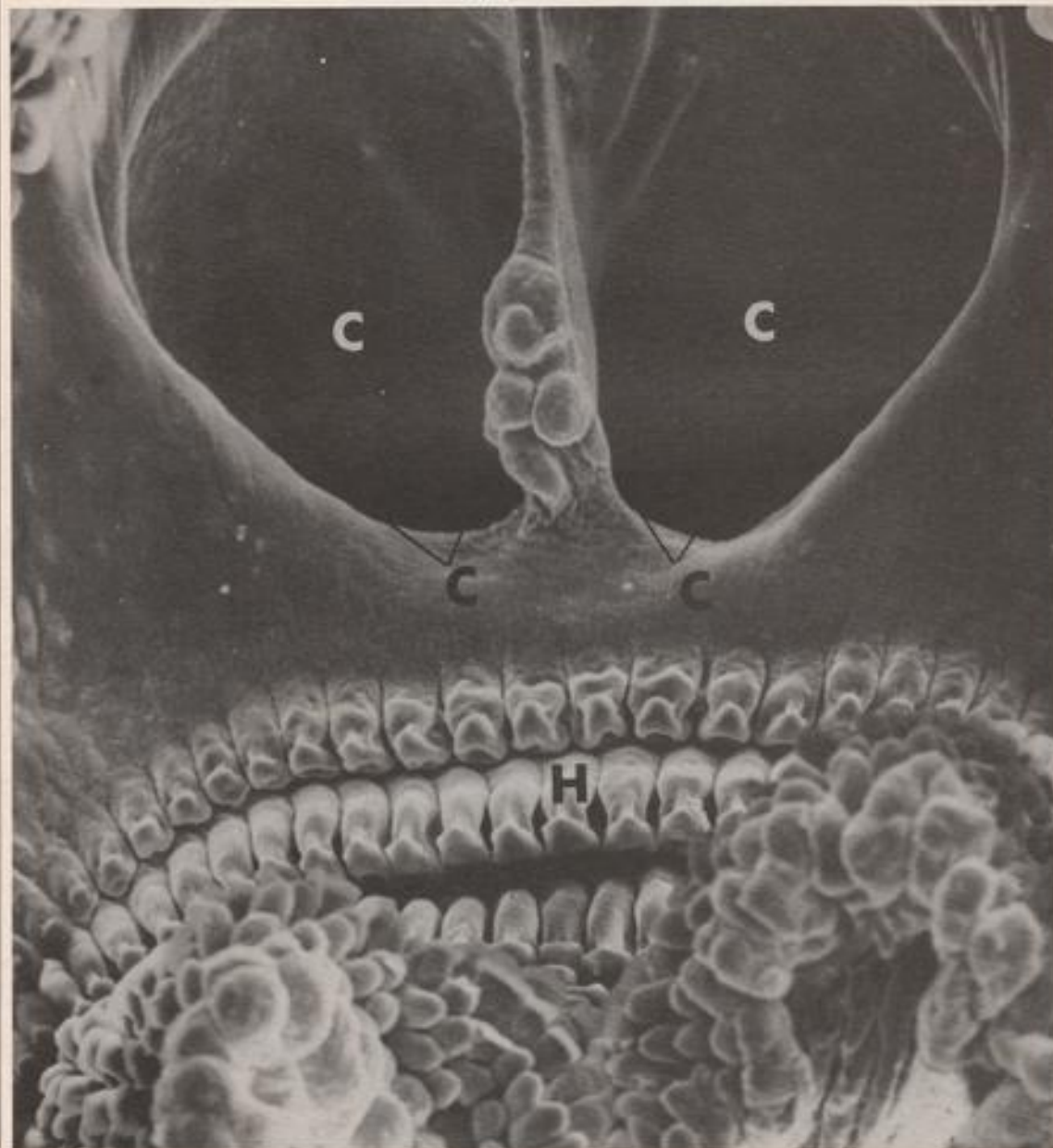
really don't know.

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#### Reference

Smith, H. M. (1945). *The freshwater fishes of Siam or Thailand*. Bulletin of the American Museum of Natural History 188: 1-622.

This is what the sucker looks like under an electron microscope. Note the two cave entrances (C) and the horny rasp (H) of the lower lip.



# Naturalist's notebook

by Eric Hardy

What is a micrarium? It isn't in the dictionary. It's a novel name for a collection of some 400 exhibits like bristle-worms, *Daphnia*, developing dragonflies and microscopic sections of plants projected through a screen where you switch on illumination and choose your magnification. It's in the old pump-house in Buxton, and the only one in the country, if not in the world. Its chief tanks are pondlife, and it opens for the new season on 22nd March.

In 1882, E. Wade Wilton, a Leeds dealer in living objects for the microscope, launched a plan for a Microscopist's Studio to be established at Clovelly in Devon because of its nearness to many "hydroid zoophytes and polyzoa". It doesn't seem to have lasted long.

The Buxton venture began 4 years ago and is run by Dr Stephen Carter, formerly with ICI and well known as a lecturer.

Many fish are notorious for the sounds they produce, often like the creaking or purring gourami associated with male courtship. He may keep you awake as his sound is more often in the evening or at night than in daytime; but I've never heard of him causing such concern as the singing toadfish caused among a houseboat colony in Saussito Bay in California in 1985. Male singing toadfish, sometimes called plainfin midshipmen, burrow into estuarine mud during the summer mating season and produce a humming or droning courtship sound by contracting muscles around the swim-bladder. These were said to echo through the cement hulls of houseboats and cause complaints to Marin County Health Department. Investigations by the local Steinhart Aquarium director finally settled on the toadfish and earplugs were suggested as a remedy.

By renting a boat and floating over the noisiest spots they located at least ten 'singing' toadfish. Their sound has been measured up to 40 decibels, about ten above the ambient or non-distinguishable background noise.

Tropical paradise fish and fighting fish gulp air to make bubble-nests, even in aquaria. Michael Hansell's recent technical book *Animal Architecture & Building Behaviour* (Longman) describes the well-digger jawfish, *Gnathypops*, living for its own safety in a rather elaborate chamber dug at the bottom of a shaft reinforced with bits of shell and coral pressed into its vertical wall, as

primitive masonry, one or two metres down the sand or silt bed. Mouthfuls of mud scooped from their burrows mark their communities. What the book called the 9-spined stickleback (*pungitius*) should be called the 10-spined (the sketch of it shows 12).

Wrasses around our rocky coasts make cup-shaped nests of seaweeds in which they deposited loose eggs, some of the smaller species making lively and colourful inmates of the aquarium. Unlike most fishes these respire water through their gills much slower, and when sleeping or resting when the lights are turned off, they lie on their sides on the bottom, wriggling into an upright position when they wake up. After the female has laid her eggs, the male covers the nest with more vegetation and guards it.

Large, eel-like relatives of African beaked elephant fish called *Gymnarchus* build a corridor-nest of strands of floating vegetation for a nest. This is far more advanced than the male goby which selects a protective site for the eggs, by rock or stone, then seeks a female. He fans the adhesive eggs with his fins to maintain a current, but has no interest in the fry when they hatch. Pipefish and sea-horses evolved a different protection for the eggs where the female transfers them to a brood-pouch on the underside of the male's body.

Different again is the delicate envelope of mucous slime secreted from the glands of tropical parrot-fish in which they sleep among the coral reefs. An opening at the front of this cocoon guarded by a flap allows the water to enter, and a hole at the back allows it to escape, so the fish continues to respire. This may be protective camouflage from enemies. It may be made in the aquarium, but sometimes these fish just wedge themselves into crevices for the night.

A nest-maker not mentioned in Hansell's recent book is the tropical South American mailed catfish or hassar, *Callichthys* which also constructs nests for its eggs. This fat, barbed inhabitant of Guiana ponds and rivers makes its nest of grass-blades and leaves among the sugar marshes, guarded by the parent until the eggs hatch. The nest is more often in a muddy hole above the water than in it, because this is one of the land-living fish able to survive when the pools dry out, when it can make long journeys overland in the hottest season. It then burrows into

the mud until rains return.

Of course as well as the freshwater sticklebacks, the more solitary 15-spined seaside stickleback also makes a nest by sticking fronds of seaweed in a rocky pool, with the aid of secretion from its kidneys. While freshwater stickleback nest are about the size of a gooseberry, these are more the size of a man's fist, pear-shaped and bound together with the thread-like secretion. A cavity is formed by the fish's body and after securing a mate she lays in it much larger eggs. The male then mounts guard. It is usually among the smaller seaweeds and corallines, even in the loose end of a rope.

The famous mudskipper excavates a coastal burrow, a metre or two vertically down the muddy seabed, but unlined. This was kept in the tropical hall of London Zoo aquarium before the war. These fish attracted more attention when they climbed out of the water, for like the chameleon they rotate each knobby eye in different directions. Torquay aquarium has shown them in recent years, feeding them on white worms. They walk about with their heads raised in an absurdly dignified manner. These, too, dig several feet into the mud in the dry season, leaving a small hole for ventilation.

Of course, what we are mostly interested in is the evolution of these nests and burrows: how and why fish first made them. It was probably linked with shelter or increasing predation by enemies that eat fish-eggs, and a survival of those laid in weeds or holes. A change in the use of a structure can be seen in the caddis-flies of freshwater streams. A primitive development by one is a silken tunnel attached to the bottom and open at each end, used for shelter. Another uses one as a permanent shelter, to pounce upon prey. Another adds a capture-net to take prey swept through by the current. This progresses in more advanced species to a moveable protective case they drag around with them.

Nest-building in fishes must have a genetic basis as it is inherited, but individual variation in structure or use may have advantages which may be preserved by natural selection and become more widespread, even replacing the original pattern. These variations may be responses to changing habitat. For example, fish introduced to a new tank tend to become more varied in behaviour.

# Coldwater jottings



Stephen J. Smith

## Coldwater Success at 1985 Peterborough Show

Coldwater fishkeeping enthusiast, Alex Stephenson, almost swept the board at the Peterborough Fishkeepers Association open show last October, taking five places out of eight in the goldfish sections.

This was the first open show organised by PFA; show secretary, David Harper, and his colleagues are to be congratulated on their thorough organisation which led to the show's smooth running, from an exhibitors' point of view, right through from first benching to final debenching.

A further indication of the emergence of the coldwater interest in general is that out of a total of 357 fish on show, 49 of them were coldwater: Singletail Goldfish, Twintail Goldfish and A.O.S. Coldwater.

My only criticism would therefore be that goldfish sections in particular should be divided according to strain. It is inevitable that anomalies arise when, for instance, Moors are judged against Lionheads.

In addition, goldfish keepers are among the keenest fish breeders in the country, and it was a disappointment that there was not a coldwater class in the show schedule.

However, for the organisers to give consideration to these minor observations the support of exhibitors is essential. There would be little point in setting up classes for individual strains if the outcome is only a handful of fish in each class.

Results of the coldwater section were as follows:

### Singletail Goldfish

- 1st G. Stephenson, Shubunkin.
- 2nd G. Stephenson, Shubunkin.
- 3rd J. Short, Common Goldfish.
- 4th G. Stephenson, Shubunkin.

### Twintail Goldfish

- 1st E. Broderick, Lionhead.
- 2nd G. Stephenson, Calico Oranda.
- 3rd G. Stephenson, Oranda.
- 4th S. J. Smith, Lionhead.

### A.O.S. Coldwater

- 1st T. Webb, *Notropis lutrensis*.
- 2nd T. Maguire, *Notropis lutrensis*.
- 3rd N. Bemer, *Cottus gobio*.
- 4th W. Irons, *Cottus gobio*.

Mr. Stephenson, known as Alex, hails from Wendling, near Deerham and has been keeping goldfish since 1952. Although at one time a keen breeder, he explained, "Unfortunately, my work on an offshore gas platform has put paid to my efforts at breeding, but I have

been getting much more involved in the hobby again recently".

### Mermaid

My colleagues in the design studio next door had been ribbing me for months about my interest in fishkeeping, but I soon shut them up when I told them that as well as goldfish in my ponds there are also . . . mermaids!

I took the picture during a photo-session for my local Sunday newspaper, which was covering the story of the Association of Midland Goldfish Keepers display as part of a month-long "World of Water" exhibition held at Birmingham's massive Central Library in October.

Adding more than a little cheer to this cold winter, the 'mermaid' is 19-year-old model Helen Care from Sutton Coldfield, while the fish . . .

Here's one singletail which is bound to win 'best in show'.

Seen at the "World of Water" exhibition in Birmingham. See Mermaid



# Tomorrow's aquarist

## Fish names—old, common and new

1986 has arrived and *Tomorrow's Aquarist* welcomes it with a brand-new competition sponsored by Tahiti Aquariums, the well-known and highly successful Manchester-based aquarium manufacturer featured at length in our December issue.

All you have to do to win one of the exciting, valuable prizes donated by Tahiti Aquariums is to go through the jumbled-up lists of names of fish species given below and match their common, old and 'new' names correctly.

For example, here is a set of jumbled-up names:

Common Name	Old Name	New Name
Guppy	<i>Limia melanogaster</i>	<i>Poecilia reticulata</i>
Blue Limia	<i>Lebistes reticulatus</i>	<i>Poecilia melanogaster</i>

The rearranged, correct set is:

Common Name	Old Name	New Name
Guppy	<i>Lebistes reticulatus</i>	<i>Poecilia reticulata</i>
Blue Limia	<i>Limia melanogaster</i>	<i>Poecilia melanogaster</i>

Simple, isn't it? As is usual with T.A. competitions, this one is divided into an Under-16 Section and an Over-16 one. If you are still 15 years old on 31 January, you qualify for the Under-16 Section.

Now select the list appropriate for your age group and have a go! You could be one of the lucky winners to receive a **Marina Aquarium**, fitted with a **Marina Hood** and a **Modular Stand** (fuller details of the prizes are described below).

### Under 16 Section

Common Name	Old Name	New Name
Molly	<i>Platyplecilia maculatus</i>	<i>Astyanax fasciatus mexicanus</i>
Platy	<i>Hyphessobrycon innesi</i>	<i>Poecilia sphenops</i>
Blind Cave Fish	<i>Mollinera sphenops</i>	<i>Xiphophorus maculatus</i>
Neon	<i>Anoptichthys jordani</i>	<i>Paracheirodon innesi</i>

### Over 16 Section

Common Name	Old Name	New Name
Golden Nyasa Cichlid	<i>Apistogramma ramirezi</i>	<i>Pelvicachromis pulcher</i>
Ram	<i>Haplochromis multicolor</i>	<i>Melanochromis auratus</i>
Krib	<i>Pseudotropheus auratus</i>	<i>Pseudocrenilabrus multicolor</i>
Egyptian Mouthbrooder	<i>Pelmatochromis kribensis</i>	<i>Papiliochromis ramirezi</i>

## How to enter

- 1 Select the set of jumbled-up names appropriate for your age group.
- 2 Re-arrange the names in matching order as in the Guppy and Limia example given earlier.
- 3 Write your re-arranged lists in full, along with your name, age and address (in block capitals).
- 4 Post your completed entry to reach us by 10 February at the very latest, addressing the envelope to:  
**Fish Names Competition,  
Aquarist & Pondkeeper,  
The Butts,  
Half Acre,  
Brentford,  
Middlesex, TW8 8BN.**
- 5 The first name drawn from the correct entries in each age group on 11 February will be announced in the March edition of

*Tomorrow's Aquarist* and will receive the following prizes:

## The prizes

### Under-16 Section

- 1 A 24 in. x 12 in. x 12 in. **Marina Aquarium** designed with an attractive cream-coloured moulded plastic frame and a special floating base arrangement which does away with the need to use the usual cushioning polystyrene sheet.
- 2 A **Marina Hood** to fit the above aquarium. **Marina Hoods** are dark brown in colour to tone in with the cream colour of the aquarium frame. The unit is totally self-contained and includes, among other features, a condensation barrier, push-out sections to accommodate filters, airlines and other accessories, an in-built starter and choke for a fluorescent tube, plus the tube itself.



Marina Stand, Aquarium and Hood



Blind Cave Fish—but what is its current valid scientific name?

- 3 A **Modular Stand** to hold the above aquarium. The stand comes in kit form and can be easily assembled in minutes. It has adjustable feet and a tinted glass shelf.

**Total Value: About £85.00.**

### Over-16 Section

- The prize in this older age group is as for the Under-16's, but in the larger 36 in. x 15 in. x 12 in. size.

**Total Value: About £90.00.**

*Tomorrow's Aquarist* readers have always responded magnificently to our regular challenges. We look forward to another massive entry. As ever—don't delay—and Good Luck!

# TILAPIA

## ANCIENT AND MODERN

Paintings on Egyptian tombs of 2000 years plus B.C. indicate that Tilapia like species figured on the menu of those days.

William Ross writes about his experiences with Tilapiine species and hybrids. Photographs by the author



**F**ish-minded visitors to Egypt, I am sure, must be fascinated by some of the engravings and paintings of piscine subjects on the walls of many tombs. At Sakkara during the fifth dynasty (2,600-2,190 B.C.) a tomb prepared for the doctor of King Unis has some very fine engravings of fish on its walls, one of these is closely identified with Tilapia, possibly styled on a fish from the river Nile which flows close by. Further up the Nile facing Luxor, at Dier El Bahari, stands the imposing funeral temple of Queen Hatshepsut who reigned for a period during the eighteenth dynasty (1,580-1,085 B.C.). Whilst reigning as Pharaoh she commanded and financed a natural history survey of the Red Sea.

As was the custom in those days, this survey is depicted by pictures and engravings on the walls of her funeral temple; amongst these are some very fine engravings of marine fish. Although the royal tombs are, as one would expect, the most grandiose, it is not until the fish-minded visit the "Valley of the Nobles" that they find the more fascinating fish pictures. The Nobles were more concerned with everyday happenings and these are depicted on their tombs. Two Nobles, Menena (c. 1,380 B.C.) and Nebamun (1,356 B.C.), give us a better insight into life in and on the Nile during their era. Paintings from Menena's tomb depict a river scene in which fish predominate, especially a large Tilapia type specimen. Another painting is of food, possibly being prepared for a banquet. This culinary collection is surmounted by a pair of Tilapia-like fish. The details on these two fish is remarkable: one has a typical large pointed dorsal fin of a male Tilapia whilst the other looks very much like a female of the same species.

The painting from Nebamun's tomb is displayed in the British Museum and is a wall painting of an ornamental pond containing ducks, water plants and fish with markedly striped tails very similar to *Oreochromis niloticus*, a large cichlid still found in the Nile today. From the ancient tombs of Egypt we have a fairly clear picture of Tilapia being caught for food and possibly the early culture of these beautiful fish as decoration in the ponds and also as an easily obtainable source of fresh fish for the 'pot'.

Fish farming as a means of producing food has been on the increase in warmer climates and tilapiine fish have been one of the most frequently cultured. Many aquaculture centres are now hybridising these fish i.e. male *Oreochromis aureus* × female *O. niloticus*. This cross produces 100% male fry which is advantageous in that no breeding occurs in the growing-on ponds therefore alleviating overpopulation.

Left: Wall painting from the tomb of Nebamun (British Museum). Below: *Oreochromis mossambicus* female and fry. Found in fresh water in the tropical parts of its range but to the south, in lower temperatures, it is found in brackish water. Bottom: Red Cherry Tilapia, *O. mossambicus* and *O. hornorum* was produced in Florida.



Unfortunately, because of hybridisation, it is now fairly difficult to obtain pure tilapiine fish and it would be helpful if an importer would reintroduce some wild stock.

I would like to take this opportunity to relate my personal experiences with tilapiines and tilapiine hybrids.

*Oreochromis mossambicus* (Peters, 1852) Mozambique Mouthbrooder. This is my favourite, possibly because it was my introduction to tilapiines and the intricacy of hybridisation of these fish. Natural distribution: East Africa, south to the Zambesi river and Port Alfred.

Occurring in fresh water in the tropical parts of its range, but to the south, where temperatures are lower, it is increasingly found in brackish water. It has been cultured for food and has been taken all over the tropics for this purpose.

Growing to 38/40 cm in the wild, seldom exceeding 15 cm in aquaria, it reaches maturity and breeds at 10 cm. As their common name implies, they are mouthbrooders, the female brooding the eggs. Colouration is variable depending on age and mood, males more colourful than females.

The method I use for spawning these fish is with one male and three females.

This combination, I have found, lives peacefully together. Whilst spawning there is a great deal of activity without any real damage being sustained by the females. The four fish are housed in an 86 cm x 30 cm x 38 cm deep aquarium with undergravel filtration. Temperature is maintained at 25°C. Approximately 25% of the water is changed weekly in this set up. The male clears a deep saucer-like depression in the gravel and then entices a female to spawn in it. The female lays her large brownish eggs in the depression and as she picks them up into her mouth, the male hovers in front of her releasing his sperm. The pair form a 'T' with the male's ovipositor in front of the female's mouth. When spawning is completed, the male loses interest in the female. At this stage I usually move the male and the non-brooding females to another tank.

Care of the brooding female is minimal and she is left undisturbed. As the eggs develop, the female's lower jaw becomes distended and dark specks can be seen through the stretched skin which are possibly the eyes of the developing embryos. The fry are released around 8th/9th day. When threatened the female continues to collect the fry in her mouth up until the 26th day of brooding. This is quite a feat and she resembles a hamster with her packed jaws. The method of

collecting the fry is interesting as the female appears to give a signal and the fry pack themselves into her mouth. Another interesting feature of the brooding female is her colour patterns. She becomes much more distinctively marked. From these observations I believe they could be warning colours. I placed a hybrid female in an adjoining aquarium and when this female saw the nursing mother, she moved as far away from her as the tank would permit. She always appeared very agitated if for any reason she was close to the brooding female. The fry grow well on crushed flake food and they are always ready to eat no matter how often they are fed.

On a couple of occasions when I have left brooding females in a community tank I have found them eating food on the fourth day. This was not done with their usual gusto but very gently. On each occasion that I have observed this, the female produced living young at the end of her term. I have also seen a very young female, on her first spawning, brood some Malayan livebearing snails (*Melanoides tuberculatus*) with her eggs; she must have picked them up at the same

*Oreochromis niloticus* x *O. aureus* (male). A beautiful hybrid where the females are often as colourful as males making sexing more difficult.

time as she collected her eggs. This spawning description is typical of *Oreochromis* species.

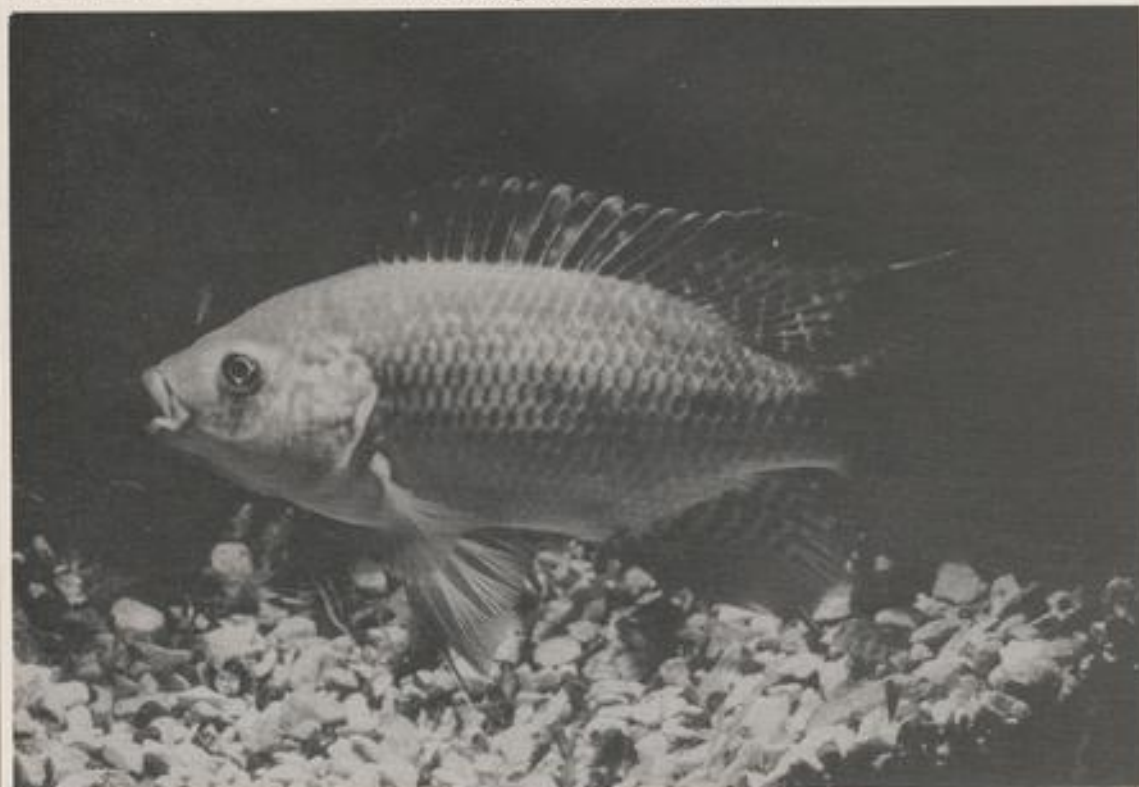
*Oreochromis niloticus* (Linnaeus, 1758)  
Nile Mouthbrooder.

A widespread species in Africa, found from East Africa across to the Congo and Nigeria, extending north along the Nile to Syria and Israel. It is one of the larger cichlids growing to around 50 cm. A strain of all black males is found in Lake Zwai in Ethiopia and in a crater lake on an island in Lake Turkana (Rudolph) and is reported in some small lakes in Ruanda.

I have been fortunate in obtaining a pair of *O. niloticus* from Stirling University in Scotland and these are guaranteed pure *O. niloticus*. A word of warning, these fish tend to jump out of the water when excited therefore great care is required when netting them.

*Oreochromis aureus* (Steindachner, 1864).  
Natural distribution West Africa, Egypt, Israel and Jordan, it has been spread throughout the tropics as a food fish.

An active, hardy and somewhat aggressive, shoaling cichlid. Grows rapidly to around 40 cm. Very similar to *O. niloticus* but differs in that the caudal fin never bears the regular dark vertical stripes of *O. niloticus* but has a broad



pink to red distal margin. Dorsal fin spines XVI compared with XVII in *O. niloticus*.

*Oreochromis niloticus* × *O. aureus*.

I was fortunate in obtaining five of these hybrids from a commercial fish farm. The cross of a male *O. aureus* with a female *O. niloticus* is reputed to produce 100% male fry. My five fish had been from a second cross, the hybrid back to its parent. On maturing, there were four males and one female. In my opinion these are some of the loveliest tilapia fish I have seen. Often the females are as colourful as the males, making sexing a little more difficult. Unfortunately, enhanced beauty is not the only noticeable characteristic of this hybrid. It is also the most aggressive one I have kept. From my five fish one small male was killed and the female and the two other males were continuously bullied by the remaining male. On removing the bully, the female assumed this role, making life very difficult for the remaining two males. I eventually parted with these two males.

Trying to keep the remaining pair together was trying to my 'nerves'. The male had the edge on the female necessitating the use of a glass tank divider continuously. This divider has given rise to an interesting observation.

I had been watching for the time when I felt the female was ready to spawn, planning to remove the partition at this stage. One day I found her brooding eggs and she continued this for about one week and then ate the eggs. Approximately one month later, when I was about to do my weekly water change, I found her brooding again. I thought it was another 'phantom pregnancy'. As I changed the water I noticed a small gap below the divider and this I refilled with loose gravel. About seven days later, whilst watching the female, I had a glance into her mouth and thought I could see fry! The following day she released them into the aquarium. This pair of fish may have shown us the way to spawn these aggressive cichlids. An open mesh divider would possibly facilitate the passage of sperm, avoiding the close contact usually required by the parents. It may have been luck this time, but I feel it holds great promise for future spawnings with no danger to either fish. In hybridising it is extremely important to keep detailed records on fish used. When parting with the offsprings, impress on

*Oreochromis niloticus* (male) One of the larger Cichlids. A strain of black males is found in Lake Zwai in Ethiopia and on an island in Lake Turkana.

the receiver the parentage of their new acquisitions.

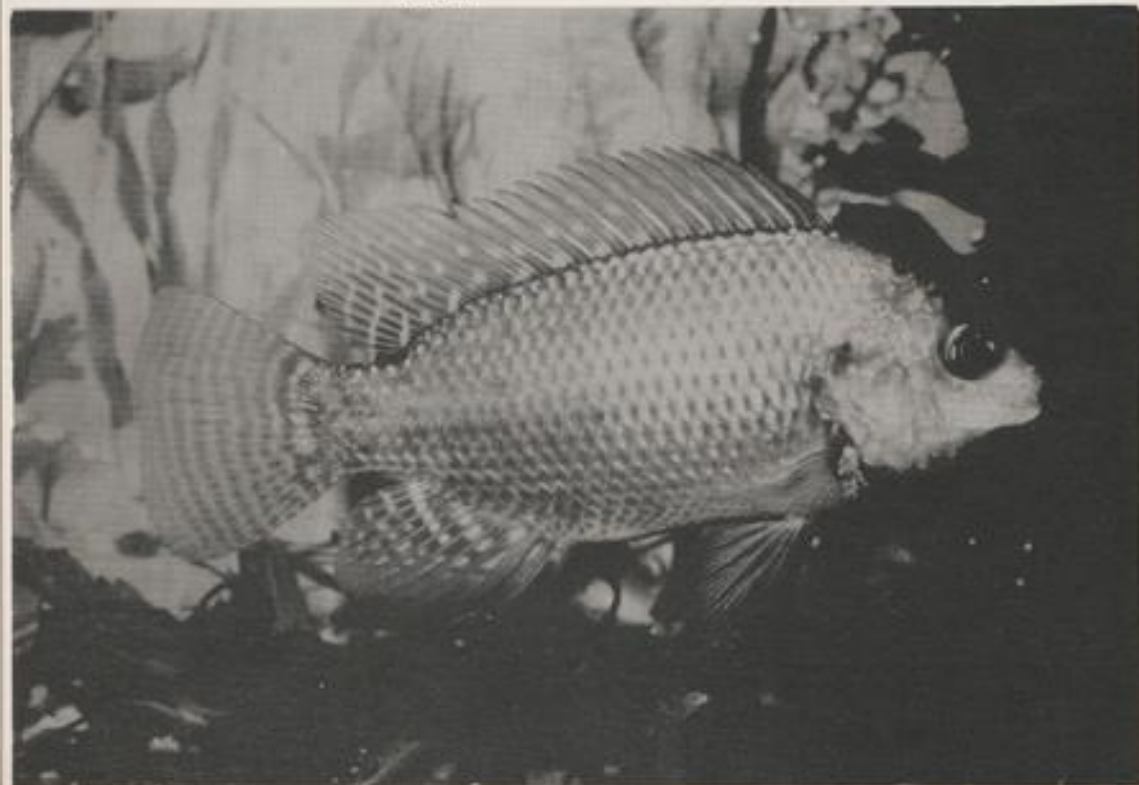
*Oreochromis mossambicus* × *Oreochromis urolepis hornorion* (Trewavas, 1966).

Red Cherry Tilapia.

This beautiful hybrid was produced in Florida. Red Cherry Tilapia is a commercial name to give it more selling appeal for the 'pot'. Its colouration varies from cream through pink to almost red and some may have dark patches on them. This hybrid is another of the reputed 100% male fry, but in practice I have found it is not so as I have two records of female fry occurring. A very good friend has a pair which have bred producing Red Cherry fry. These parent fish came from Taiwan. I have a pair from Florida but as yet have had no success in spawning them.

The male hybrid I did manage to spawn with a pure *O. mossambicus*. This was a young female and her first spawning; she only produced one live offspring. This fry has grown well and it is a lovely goldy colour showing normal *O. mossambicus* markings.

From my experience with tilapia fish, I could not recommend them to every aquarist, but I feel cichlidophiles would appreciate them. If you feel the need for a challenge, hybridising these cichlids would fulfil this requirement.





# Helping hand



## Nick Lushchan

A Happy and Healthy New Year to all readers of *Helping Hand*!

### Access to Premises

From the comments I have received, this article is read by a very wide following, fishkeepers and traders alike. So far, reactions and comments from traders have been very interesting and have resulted in positive moves regarding access to premises.

I have received a large number of enquiries from shopkeepers, wishing to provide ramps, thus making their premises more accessible both to the disabled and the public in general.

Having spent a weekend at the Alexandra Pavilion Trade Exhibition (P.P.M.E.) and talking to traders and manufacturers regarding requirements for the disabled aquarist, I was impressed by the overwhelming response I received. If they all do their bit, I shall be very busy for a long time to come.

Quite a number of traders would like to help and make an effort with access, or just help out in any other way they can.

### The Wheelchair Logo

In the next issue of *Helping Hand*, I shall list a number of premises that have started to use the Wheelchair LOGO in their advertising and have provided that extra facility for making things more accessible. So, if you have the facilities and wish to make your premises known to the disabled fishkeeper, drop me a line, or, if you require some assistance with providing these facilities, please don't put it off for a later date. I am more than willing to talk and, if possible, help out with any

problems that you might have or you are unsure of.

### A Letter from Lorna Spencer

One of the nicest things of doing the *Helping Hand* series is hearing from others within the hobby, regardless of age or health. It is always that much more pleasant when one hears nice things and not just complaints. Here is a letter from Miss Lorna Spencer, 3 Crossways, Whitestone, Exeter.

"In case you are interested in accessible shops, I went to Roman Tropicals in Bow, London, last week. One step at the door and then, the most beautiful array of marines, tropicals and just a token amount of coldwater tanks—all easily seen from a wheelchair. Tanks, etc., are all on the next floor, but the staff are very helpful and one chap, probably the proprietor, was most informative. Unfortunately, we didn't have a lot of time there as they were just closing but it's well worth a visit. As a newcomer, I think that this is a terrific hobby for someone more or less at home all the time. As I'm sure you'll appreciate, it isn't the cheapest hobby around, but with the extra discounts offered by companies, such as Aquamail, this makes things considerably easier. Whilst on the subject of cost, have you used either the Tunze or Dupla systems? My reason for asking is that, if they are "self-sufficient" in terms of minimal maintenance, would the initial cost outweigh the aggravation of having to ask "Good old Dad" to do the water changes, etc., especially as I am considering the inevitable next step of

trying marines?"

**NOTE.** As you will see from ads in *Aquarist & Pondkeeper*, Roman Tropicals is now under new ownership. (NL).

### Frank stands down

Frank Richardson is a well-known aquarist in the North Yorkshire area. Although Frank has been disabled through polio for some 20 years, he has found that the hobby of keeping fish helps him through the rough and smooth days of his life.

Frank, with a "Helping Hand" from his wife, Vena, has manned the Information Stand at all the Yorkshire Aquarist Festivals and writes saying that: "I should perhaps tell you that we came to a decision only last week to let someone else have a spell of duty with the Information Stand. We have attended Shows and Festivals for some eight years with the Stand and feel that it is time for new blood to have a go. We shall still be around at Open Shows but we shall not feel obliged to turn out to Shows every Sunday during the season, especially on cold wet days".

Frank and Vena, who have been members of Scarborough & District A.S., have, deservedly, been made Life Members by that Society. (NL).

If you have any news which you feel should be published in *Helping Hand*, drop me a line. In the meantime: Good Health and Happy Fishkeeping, Nick Lushchan, 27 Hungerford Road, Rugby House, Calne, Wilts. SN11 9BH.



Left to right: Mrs. G. Andrews, wife of Mr. Geoff Andrews who was, for many years an 'A' class judge, Mrs. Vena Richardson and Mr. Frank Richardson, taken at Y.A.A.S. Festival, 1985

# EUROPEAN LIZARDS IN THE GARDEN

A number of lizards from Europe are better suited to outdoor quarters than to indoor vivaria and, beginning with breeding, Julian Sims continues to impart his advice on how best to cater for their needs

Unless the gravid female is actually observed excavating a nest or laying eggs, an infilled nesting site will be almost impossible to detect when completed. If a sunny sandy site has been chosen, and the average temperature remains above 25°C for six to seven weeks, then the eggs have a good chance of hatching in the reptiliary. However, by far the safest way of ensuring breeding success is to artificially incubate the eggs. There is an element of luck here because nesting must be observed so that the eggs can be collected afterwards. As many female lizards lay two clutches of eggs per year, if the first set is not found there is usually a second chance to collect the eggs of the later batch.

## An artificial incubator

The eggs should be placed with a minimum of disturbance or rotation in an inert medium, preferably vermiculite, in plastic 2 litre ice-cream containers. The vermiculite is best moistened once a week by pouring luke-warm water around the edges of the container, not directly onto the eggs. Lizard eggs are flexible shelled and expand during incubation. Vermiculite is not a dense medium, and so gives the eggs this essential opportunity to increase their size without fear of constriction. Incubating temperatures range between 25° to 30°C and can be maintained by using either a 40 or 60 Watt tungsten filament household bulb in circuit with an aquarium thermostat, appropriately calibrated. An aluminium locust-rearing cage with glass panelled front for observation makes an ideal incubator but a similar arrangement can be constructed out of a wooden box. If, as is likely, the bulb blows within the six to seven week period of incubation, the temperature can drop to as low as 20°C without apparent damage to the developing baby lizards. However, 'death in shell' towards the end of incubation is a real problem with captive breeding and emphasises precisely why adult lizards should not be kept in an indoor vivarium.

Death of young lizards just before or just after hatching is all too often related to the inadequate diet of their mother. Lizards kept out-of-doors have the oppor-

tunity of catching a wide variety of molluscs, annelids and insects including crickets, and earthworms and slugs. All of these invertebrates have a high calcium content. Some of this calcium is transferred to the yolk of eggs and used by the developing embryonic lizards to form strong skeletons. A strong skeleton gives sufficient support to allow the fully formed hatchling to break free of the egg shell and survive.

Adult lizards permanently kept indoors do not get the great variety of invertebrate food available to 'free range' lizards. Indeed, mealworms (*Tenebrio molitor*), the traditional food provided for captive lizards, usually have a very poor calcium content. The mineral content of mealworms can be greatly improved by adding slices of apple and Complan powder to the bran in which they are cultured. Female lizards kept indoors without a supplemented diet lay eggs deficient in calcium. The baby lizards mostly die in the egg with rickets—their limbs not having the strength to allow escape.

## The importance of vitamin D and phosphorus

The provision of sufficient calcium is, however, only part of this problem. Vitamin D<sub>3</sub> (cholecalciferol) is also necessary for this mineral to be absorbed from the diet and to be used in conjunction with phosphorus to harden the bones of the skeleton. Insects contain virtually no Vitamin D but it can be formed by lizards during basking in natural sunlight, due to the Ultra-Violet rays present. Lizards kept indoors don't have access to this essential full spectrum sunlight because the glass of house-windows, and of the vivarium, filter out the useful ultra-violet wave-lengths. Similarly, lizards kept in the garden in a glass propagating frame or a greenhouse will receive filtered sunlight and the glass will also restrict the number of insects which can fly in and provide 'natural' food. Glass panels permanently placed over the reptiliary to warm up the internal climate or the use of very fine netting to keep out birds and cats will also impose similar limitations. Eggs laid by female lizards kept under such conditions are unlikely to provide healthy viable hatchlings.

## Plants in the reptiliary

To ensure as varied a diet as possible, the reptiliary should be stocked with low, flowering plants which will attract insects throughout the Spring, Summer and Autumn.

Suitable species include: *Aubrieta*, both pink and purple varieties, Lily of the valley (*Convallaria majalis*), Prostrate Rosemary (*Rosmarinus officinalis prostratus*), small Phloxes including the alpine *Phlox amoena*, Sand Phlox *P. bifida* and the rosette *P. heuseyi*, Rock Speedwell (*Veronica saxatilis*) which only grows 3 inches tall, Pinks and Carnations (*Dianthus* sp.), Thymes including *Thymus pinnatifidus*, *T. citriodorus*, *T. comosus*, *T. doerfleri* and *T. serpyllum* and Stonecrops including *Sedum acre* native to Britain and spectacular Ice Plant *S. spectabile* from China.

Tall plants should not be cultivated as long stems can be used as an escape route to climb past the internal overhang. However, low, non-flowering plants such as ferns and dwarf conifers are important in providing shelter and sites for 'dappled' basking. This is where only part of the lizard is exposed to sunlight, an important method of controlling body temperature (thermoregulation). Pesticides must not be used in the reptiliary, or in the other parts of the garden, to avoid contaminating insects. Hopefully, the neighbours will also refrain from introducing chemical poisons into the food web in which lizards are consumers.

As such, lizards are a positive advantage in the natural control of garden pests. If Slow-worms are bred in the reptiliary they will quickly reduce the limited slug population enclosed. This can be regularly replenished by collecting additional slugs from other parts of the garden during wet evenings or after dark by torch-light. However, after a few months this 'human predation' will severely limit even this stock and more and more time will be spent collecting fewer and fewer slugs. Indeed, the use of re-chargable batteries in the torch is strongly recommended. Slugs then have to be caught from other sources, school playing fields being particularly profitable. One must be certain that these other sites are not treated with pesticides in general or 'slug pellets' in

particular. Slugs from road-side verges can have a high lead content from grazing on vegetation continuously subjected to fumes from car exhaust pipes.

#### Care of hatching lizards

Unfortunately, by the time the baby lizards hatch from their eggs, especially from the second clutch of the year, many of the insect-attracting flowers listed are past their best. There is also insufficient time left before hibernation for prolonged feeding and reasonable growth to be achieved. Thus the safest way of ensuring that young lizards survive their first winter is to feed them indoors, bearing in mind the dietary and environmental shortcomings this involves.



Vitamin D must be added to the diet—either directly to the drinking water as ABIDEK or by dusting the live insect food with a multi vitamin and mineral powder such as VIONATE just before the insects are released into the vivarium. As Vitamin D is quickly oxidised, the drinking water must be changed every other day and the Abidek replaced. Abidek is manufactured by Park-Davis Co., Pontypool, Gwent. Vionate, which also contains essential calcium, is manufactured by E. R. Squibb and Sons, Regal House, Twickenham, Middlesex. Insect food should include Fruit flies (*Drosophila sp.*) house crickets (*Acheta domestica*)—the early instars, and small mealworms. All are easily bred. The diet of mealworms should be supplemented as previously described to enhance their nutritional value. Tiny slugs are also available from the garden throughout the winter, found by careful searching under logs, rocks and dead leaves.

Certain types of artificial illumination in the vivarium can provide ultra-violet wave lengths, for example 'TRU-LITE' manufactured in the US by the Duro-Test Corporation and imported by Sale Tilney International Ltd, Weybridge Trading Estate, Weybridge, Surrey. Many good aquarist suppliers stock these tubes.

#### Lizard species for the reptiliary

To ensure breeding success it is important not to stock the reptiliary with too many different species—however

Left: more colourful than the common lizard, sand lizards are viviparous and produce little black offspring. Below: with a tail twice as long as the head and body, the green lizard is graceful as well as colourful, the male having a blue throat in the mating season.



tempting this may be.

Snakes and lizards must not be mixed—the lizards would soon provide a tasty snack. A further problem occurs with larger lizards which will prey on smaller lizards, for example, Green Lizards will seize smaller Wall Lizards behind the head and shake them violently until the vertebral column is fractured.

Three of the most successful species of Wall Lizard are the Common Wall Lizard (*P. muralis*) from France and Italy, Bocage's Wall Lizard (*P. bocagei*) from northern Portugal and the Italian Wall Lizard (*P. sicula*). Additionally, two other hardy species are Lilford's Wall Lizard (*P. lilfordi*) and the Ibiza Wall Lizard (*P. pityusensis*) but these have a very limited distribution in the wild, only being found on the Balearic Islands.

Mature male Wall Lizards are often more colourful than the females and adult male Green Lizards can be identified by the blue colouration of their throat. This difference in colouration is known as **Sexual Dimorphism** and is often important in territorial displays. However, some lizards are **Parthenogenetic**, i.e. the female can reproduce without fertilisation. An example is the Rock Lizard (*L. saxicola*) from further east in the Caucasus Mountains. Once this ability has evolved in any population it will continue because the 'daughters' which develop are genetically identical with their mother.

#### Conservation and legislation

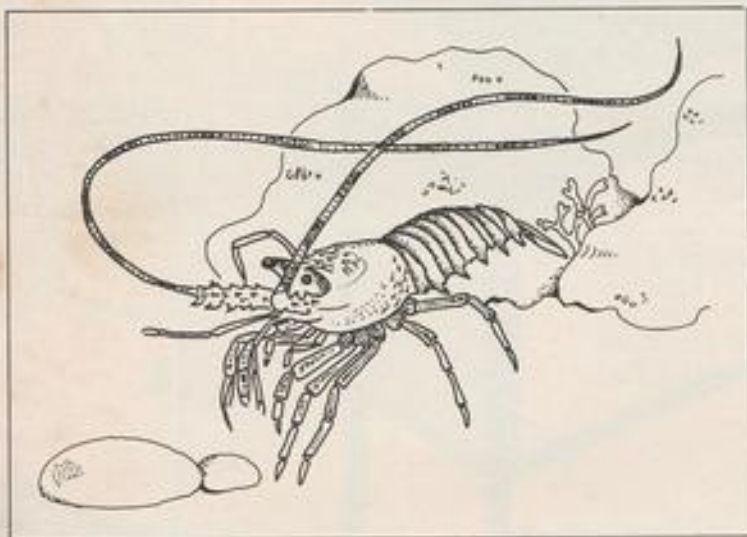
The majority of the European lizards described are on the list of 47 species of reptile protected in their natural environment by the Berne Convention, opened for signature in September 1979. This is irrespective of whether they occur widely throughout the Continent or only have an extremely restricted distribution limited to two or three small islands. International trade in wild caught reptiles is thus strictly controlled with export licences issued by their country of origin and import licences issued by the Department of the Environment in Britain. However, these trading restrictions do not apply to second generation captive bred animals under the terms of the 1973 Washington Convention on International Trade in Endangered Species (CITES).

Additionally, the 1981 Wildlife and Countryside Act gives extra protection to the three species of British lizard. Due to its very limited distribution, the Sand Lizard is an endangered species in Britain and enjoys complete protection. It is also illegal to sell Common Lizards or Slow-worms without a licence.

Having bred these lizards in a garden reptiliary, their offspring can be released to colonise other suitable sites in the wild. One final word of caution, it is now illegal to release 'introduced' species into Britain. This measure is to prevent a further decline in our native species by reducing the risk of competition for food and/or breeding sites. Thus excess captive bred continental lizards must not be released.

# THE LOVE SONG OF THE SPINY LOBSTER

by Dr Andrew Allen



Jacques Cousteau gave the title *The Silent World* to one of his books about the sea. But crabs, lobsters, shrimps and fish are not the silent denizens of the sea that many people imagine them to be. Five or ten metres below the surface of the sea there can be bedlam. Snapping shrimps, in huge clattering choruses, quintets of rasping crabs and lobsters, and shoals of singing fish make the ocean a very noisy place indeed.

One singing crustacean that has been studied in some detail is the gregarious spiny lobster (or *langouste*), *Palinurus elephas*, to be found on the sea bed off the rocky Atlantic coasts of Europe. Sound communication, it seems, is an important part of a spiny lobster's life.

Spiny lobsters make a rasping sound, rather like a finger being rubbed along the teeth of a comb, produced when a serrated pad at the base of the antennae rubs on a projection on the rostrum, the pointed front end of the carapace or shield, between the eyes. The rostrum itself acts as a sound box to amplify the sound, which is audible up to 100 metres away. Lobsters do not have ears to receive the sound. On the antennae, and on other parts of the body too, there are minute tufts of hair. Some hairs are chemosensory, while others respond to water displacement, that is to the pressure waves by which sound is transmitted underwater.

The sounds made by lobsters serve a variety of functions. There is a general

conversational call that keeps the whole group together, and indicates that it is safe to go about foraging and grazing. In a population of spiny lobsters, which can be anything between 100 and 10,000 individuals moving in a co-ordinated group over the sea bed, there is a constant background chitchat of rasping sounds being produced at a fairly low level. If danger threatens, in the form of a shark or an octopus or a conger eel looking for a meal, the conversational call stops instantly and the warning call is given. This is the same rasping sound but given at a higher frequency rate. The higher frequency call encourages the entire population to rush for shelter in cracks in rocks and under overhangs.

## Mating call with a range of 100 metres

One situation where animals do not want to escape is courtship. Prior to mating, sound plays a key role in the love life of the spiny lobster. But it is not the male that makes all the noise—a prima donna takes the underwater stage, for lobster mating calls are performed by the female. Her mating call can attract males in a circle around her for about 100 metres. The female lobster sits on top of a rock and stridulates. All mature males head towards her. As the circle tightens the males begin to fight for the privilege of mating. One male reaches the female and she stops calling. The rest, as though a switch had been flicked, immediately lose interest and go about their daily tasks. The victor and the female then engage in a more elaborate courtship procedure. They caress antennae. The female releases aphrodisiac chemicals called pheromones into the water, and once this has happened the male is programmed to mate with her no matter what.

## The beam of sound of the pistol shrimp

Sound has an equally important place in the life of the snapping or pistol shrimp *Alpheus*. By snapping an enormous claw, half as big as its own body, the pistol shrimp can produce a very loud report. Like dolphins and killer whales, these shrimps are using beams of high intensity sound to kill prey. They will stalk small fish and when a short distance away from them will fire the claw. The fish tips over dead or wanders round and round in a daze wondering what has hit it and the shrimp catches it. This beam of sound—the nearest nature has come to inventing a death ray—is so loud that if shrimps are kept in an aquarium in which the glass is scratched and they pull the trigger, the glass is likely to shatter.

# Company profile

## The Tropical Marine Centre

"If you want the best, go to the specialists". How often have we heard this?

In the world of marines, we are fortunate in having several major specialists in UK, each with his own brand of excellence. One such specialist is **Richard Sankey**, the founder and present Managing Director of the Tropical Marine Centre in Borehamwood, Hertfordshire.

Not only were the stocks of marine organisms that we saw at the Centre first-rate, but so was the quality of the discussions held with Richard and his General Manager, **Philip Mayfield**. So much so, that what originally started off as a relatively brief visit of three hours, expanded (of its own accord) into a highly enjoyable whole afternoon and evening affair, only cut short in the end by the pressing demands of a 140-mile return journey.

The conversation started from the obvious, central factor in marine 'aquariumship'—the quality of the environment. This, of course, led to filtration, protein skimming, the use of ozonisers, ultra-violet sterilisation, the handling, debagging and acclimatisation of shipments of marine organisms, the need for sound advice, methods of fitting out shops with complete water treatment systems, the 'education' of overseas collectors and exporters and many, many other topics.

Space will not allow for full treatment of each of these points in this article. However, some must be mentioned, not only because of their intrinsic interest but also because they are applied at the Tropical Marine Centre and go a long way towards explaining why their stocks are so very good and healthy.

The story starts well before any marine fish or invertebrates reach Borehamwood. What Richard Sankey has done is actually install some of his complete water treatment systems at his collectors'/exporters' establishments overseas. This obviously plays a crucial role in ensuring that whatever marines Richard imports into UK from these dealers have already undergone a period of treatment according to his own, stringent specifications.

This, added to improved transportation techniques, again developed by Richard, results in arrivals of good quality, very low losses in transit and low levels of stress.



Part of the highly efficient filtration system at the Tropical Marine Centre

On arrival, all consignments are debagged in a specially-designed reception room where red low-intensity fluorescent tubes allow the procedure to be carried out without causing undue stress to the organisms themselves. Although there is a 'hospital' section with its own independent filtration and water treatment system, Richard finds that the majority of arrivals are in perfect condition. Most of the few that require further attention 'heal themselves' very quickly once they are acclimatised over



Good water management ensures high quality fish and invertebrate stocks

several hours to their own environment.

This new environment (obviously) contains synthetic seawater and it is the excellent quality of this water, allied to the treatment it receives, that accounts for the fishes' fast recovery.

The Tropical Marine Centre uses Tropic Marin sea salts exclusively (Richard is the sole UK agent for the brand) which, owing to the sophisticated manufacturing process used to produce the top-grade salts in the range, contain a complete set of major and trace elements in each individual 'crystal'. Chemical analysis of this salt has shown that it is virtually as close as one can get to natural seawater.

This, of course, means that the process of acclimatisation is a smooth and easy one. In closed systems such as aquaria, though, good raw materials are not enough. Unless these are backed-up by an adequate water treatment system, quality will soon deteriorate to dangerous levels.

At the Tropical Marine Centre, the system includes ozonisers, U-V sterilisers, sand filters, cartridge filters, trickle filters and protein skimmers which, together, maintain the quality of the water at optimal levels all the time.

Thus, Richard and his team practise what they preach to the letter. The success of their system is such that they now offer a complete shopfitting service to retailers.

Therefore, from start to finish, i.e. from collection in the wild to arrival at your local shop, every care is taken to see that the health of the fish and invertebrates supplied by the Tropical Marine Centre is as good as anyone could reasonably expect. Similar levels of selectivity are applied to other products associated with the Company, prominent among which are the highly successful and extensive range of irradiated Gamma Frozen Foods, medications, the Company's own (and very sound) design of U-V sterilisers and two highly regarded marine books:

*Beginner to Breeder* by Martin Moe.

*Armored Knights of the Sea* by Helmut Debelius.

For further details, contact **Richard Sankey** or **Philip Mayfield** at the Tropical Marine Centre, Imperial Studios, Maxwell Road, Borehamwood, Hertfordshire. Tel: 01-207 1234.



An easy to breed  
mouthbrooding  
cichlid from  
Colombia, the Red  
Hump Geophagus  
is a beautiful  
species, the male  
sporting a lump  
on the head  
which becomes wine  
red in colour  
during the  
breeding  
season.

By Ian  
Sellick

# Spotlight

## RED HUMP GEOPHAGUS

**T**O some, this may seem an unspectacular fish when seen as young in a dealer's tank; to others a cute clown of a fish. Whatever the feelings, no-one who has kept this popular species has failed to be captivated, although after a few successful spawnings the feelings may have become similar to those the hardened aquarist has for convicts!

*Geophagus steindachneri* is an easy to breed species, a mouthbrooder that is every bit as advanced as those from the African Lakes, but has developed this habit for rather different reasons. This is a fish that comes from the Rio Magdalena in Colombia. It is also found in the lower Rio Cauca and Rio Limón. All these rivers flow rapidly down the Andes into the southern Caribbean. As fast flowing rivers, this presents the fish living in them with a problem analogous to that in the middle Congo, where the lion-head cichlid, *Steatocranus* (another hump-headed species, interestingly) has solved it by secretive breeding. *G. steindachneri*, on the other hand, breeds in this flowing water situation by mouthbrooding and by picking up the eggs immediately they are laid.

*G. steindachneri* has an interesting history; the first specimens were collected in 1880 from the Rio Cauca and at that time ascribed to *G. brasiliensis*. In 1909 and 1910, Eigenmann mentioned the species as *G. steindachneri*, but with no description save a reference to the 'brasiliensis' nomen in his 1910 paper. J. P. Gosse, in his 1975 revision of the genus *Geophagus*, considered that Eigenmann's description wasn't adequate and said that Regan's subsequent (1912) description of the fish as *G. howlandae*, from a specimen collected at Honda on the Rio Magdalena, should be used. Hence the red-hump spent a few years being called *howlandae*. However, numerous people were not very happy with the name, and in 1981 Gosse and Kullander reversed the decision, and the fish has remained *G. steindachneri* ever since.

However, the picture has been variously complicated over the years: Brind in 1943 described another specimen from the Rio Magdalena as *G. magdalenae*; this was a rather short-lived name, being put into synonymy in 1947. The worst complicating factor was an aquarium

one; the red-hump was widely known at one time as *G. pellegrini*. *G. pellegrini* is a valid species, closely related to *steindachneri*, but is found in different rivers in Colombia (the Atrato) and Panama (the Tuyra/Chucunaque). It is also rather unlike the red-hump. The only species that closely resembles the red-hump, but is perhaps even more beautiful, is *G. cranilabrus*, from Central Panama.

*G. steindachneri* is a beautiful species in its own right, as can be seen from the Spotlight photo. Adult males are basically a yellow-brown, but with iridescent centres to all the scales that positively glow in a courting fish. Females are less colourful, but still show some iridescence. The most redeeming feature is, however, the head of the male. To be seen in its true glory, a number of specimens of both sexes should be kept in a large tank. Rival males will seemingly demonstrate their sexuality by the development of the nuchal hump, a hump on the head that becomes a bright wine-red, the origin of the common name.

The black blotches on the flanks of the male seem to be very variable with no apparent relation to geography or even genetics, although neither of these potential factors have been studied in this species. There is, additionally, an orange colour form of this species, but this only appeared briefly in the trade from the Far East and I have not seen specimens for some years now. This was simply one that had lost its melanin but retained the other colours (oligomelanism).

### Fast flowing natural habitat

Maintenance of this species should reflect the fast flowing natural habitat; clean water is essential. The chemical composition is immaterial—soft or hard water, slightly acid or slightly alkaline. A power filter or strong aeration is useful, with regular water changes and ammonia removing resins being used to eliminate nitrogenous waste products.

The tank should be reasonably large with rounded gravel as a substrate and well-provided with rocks, boulders and pieces of wood if available. Plants are not necessary, although they won't generally be eaten if included. They should be heavily rooted, however, as they risk being grubbed up by the fish as they forage for food.

A three foot tank could be used for a male and two or three females. A much larger tank will give more scope, and several males could be kept when the full behavioural repertoire will be seen.

Males will court passing females but not from any true territory. If unsuccessful, they may use pit digging as a way of trying again to attract females, but any suitable substrate may be used for spawning once the male has found a female both ripe and willing. The eggs are laid in small batches and immediately picked up by the female. It is not clear in this species where fertilisation occurs, whether in the mouth (as seems possible due to the rapidity with which the eggs are picked up), or outside.

Once spawning has occurred, the male has nothing further to do with the female. Females may be removed from the tank once spawning is complete, but are more likely to swallow or spit out eggs than are, for instance, Malawi cichlids. It may, therefore, for profitable breeding, be better to keep single pairs (with some caution), and remove the male after spawning and allow the female to brood in peace.

A typical spawn may number 80-100 eggs. The fry are free-swimming in 10 days, but usually retained by the mother for a further five days or so. There is no buccal pouch as there is in the mbuna, the fry are merely secreted in the capacious mouth to which they may return at intervals if danger threatens during the next week or so. The fry on first release may only measure 6 mm or so, but grow rapidly fed on a diet of newly hatched brine shrimp, powdered flake and finely ground ox-heart, together with a little vegetable matter.

Although females may have nibbled at a little food during brooding, once the fry are first released they should be well fed to condition them before re-introduction to the community tank.

To go back to the opening paragraph of this Spotlight—not only will females soon be ready to respawn, but fast growing precocious fry have themselves been known to spawn as soon as 12 weeks after being released.

Nonetheless, the red-hump is a fascinating and endearing fish to keep and breed, an unusual mouthbrooder—and from South America too!

# A JAPANESE FIRE-BELLIED NEWT



Looking like a gaudy version of the Great warty newt, *Cynops pyrrhogaster* is a long-lived amphibian well suited to life in the vivarium. By Patrick J. Wisniewski BSc., Cert.Ed., MSc.

In 1961, Alfred Leutscher in his classical book *Vivarium Life* wrote of the Japanese Fire-bellied Newt (*Cynops pyrrhogaster*), "Very little is known about the habits and breeding of this species. It lives well in the aquarium and more information is required about its life history". If Leutscher were writing his book today he would be justified in employing the same two sentences. Yet, as Leutscher intimated and Dorothy Cochran in *Living Amphibians of the World* clearly stated, this species "is the salamander par excellence for the novice at pet-keeping".

The Japanese Fire-bellied Newt is one of several species sometimes labelled 'Fire-bellied Newt' or 'Red-bellied Newt' by the pet trade. The other species are mostly reluctant captives and animals for the salamander specialist. The Japanese Fire-belly is a medium-sized newt, females reaching a length of 12cm whilst males are a little shorter. A cursory glance, particularly at the female of the species, gives the impression of an animal resembling the Great Crested Newt (*Triturus cristatus*), the overall colour being dark above and the skin somewhat rugose. However, closer examination reveals an animal with a chunky, broad head, large eyes and lacking the characteristic crest of the breeding male Great Crested Newt. The dorsal colouration may be dark brown to black but in some specimens the back is decorated with tiny golden-yellow spots and during the breeding season, males develop a bluish sheen. The underside; throat, belly, cloaca and lower edge of the tail vary from brick-red to vermilion blotched with black. In certain races, e.g. *pyrrhogaster*, the underside is almost entirely red, whilst in others, e.g. *sasayamae*, the red is reduced to a diffuse, median stripe. During the breeding season the male's colours become more

intense and the sides of his tail appear to glow with a cold blue light.

The male is easily distinguished from the female at all times by his stouter, almost box-like appearance. The female's body is much more sausage-shaped. He has a very flat tail which sports a filament at its extremity, much like the tail of our own Palmate Newt (*Triturus helveticus*) male. He also has much longer toes and a more flighty nature, the total impression being that of a rather effeminate little newt. Both sexes have a prominent dorsal ridge, but only the males exhibit pronounced parotid glands on the side of the head.

The Japanese Fire-bellied Newt is found throughout most of Japan with the exception of Hokkaido and it is also to be found in most American and European pet-shops. Countless thousands, perhaps millions, must have been exported from Japan to feed the hobbyist's demand for a long-lived, easy-to-feed, easy-to-keep newt. The Fire-belly is all of these. Specimens have been known to live over thirty years (and still come into breeding condition). They are greedy and feeding time in a tank of Fire-bellies has all the trappings of civil disorder. They will also survive under virtually any conditions. The perfect newt, maybe, but do they breed? Well, we will come back to that later.

The truth is that the Fire-belly is a remarkably catholic beast. In the wild it infests rice paddies, stagnant pools and glassy lakes; it even scales mountains to take up residence in shallow hill-streams. As befits such an opportunist, it eats anything that happens along (even carrion) and believe me, there are few things which do not seem to disappear into its mouth... if the Fire-belly had teeth, I would have lost a finger or two. Huge worms, almost twice the length of the newt itself

are reeled in, in workmanlike fashion and then the newt is off looking to steal a morsel from the mouth of its neighbour.

The Fire-belly is a very aquatic newt and may spend the whole year in water though it is usual for it to have a post-nuptial sojourn on land during the summer and occasionally stay there to hibernate.

Copulation is achieved in similar style to our own newts, the male placing himself before the female and vibrating his tail which is curled forwards towards his nose. She indicates her consent by nudging his side and a spermatophore is off-loaded by the male which adheres to the female's cloaca as she passes over it. In certain races of the newt, the male's display is carried one stage further, for he, presumably anxious for his chosen mate not to miss any of his Terpsichorean antics, appears to hold her in place by standing on her neck. The result of this carefully choreographed union is 200 or so eggs which hatch in twenty days and metamorphose in late summer. Sadly few amphibian keepers will have witnessed the consummation of a Fire-belly's marriage in captivity, for despite man's skill at transporting a significant proportion of his population around the world his ingenuity has yet to stretch to breeding them on a sustained basis.

For some reason, captive Fire-bellies will go through the motions and then do something totally inappropriate like laying all their eggs on land or more understandably simply producing infertile eggs. True, some have been bred successfully and I can count myself lucky in having successfully reproduced two of the races. Once the eggs hatch the tadpoles are easy enough to raise on a diet of *Daphnia* and other pond-sweepings provided they are given sufficient aeration. Without aeration the tadpoles seem prone to fungal attacks although my parent stock never receive either aeration or filtration. Yet it is difficult to pinpoint the factors which stimulate breeding in captivity. Thorn suggests that newts must be hibernated before they will breed, yet my own are never chilled. He also recommends a period of starvation in the summer, perhaps a wise precaution with such a gourmand among newts. Neither water temperatures nor water quality seem to hold the key but there must be a reason for such indifferent breeding results. It could be that you know the answer and have never thought it worth mentioning. At present I am compiling a dossier of information on the capricious *Cynops* in the hope that the mystery may be solved. Why not drop me a line if you think you can add a clue to the story?

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Well-behaved Anabantoids of attractive appearance and with good parental potential, the Combtails should enjoy more popularity but they are rarely kept, writes David Armitage

## UNDERRATED COMBTAILS



Top: *Belontia signata*. Above: *B. hasselti* showing normal patterning.

If you were to hear of an attractive fish that was a fiery red with elements of sky blue in the fins and scales, a fish that furthermore was very hardy and a sufficiently good parent to allow the development of fry in a tank also inhabited by the adults, you might expect it to be very popular in aquaria. These are some of the qualities of the best known of the anabantoid species known as combtails, *Belontia signata*. However, the fish is rarely kept. Goldstein, in the English language reference work on anabantoids writes, "Combtails have been reported as both predatory and shy, indicating that too few people have described their experiences for us to make any generalisations." A few years have passed since these words were written and we are a little more knowledgeable, so perhaps the time has come for another look at this genus.

There are, in fact, two species of *Belontia*. Strangely, the rarer and most lately discovered species, *B. signata*, is much better known than *B. hasselti* which was described 30 years earlier and is far more widely distributed. The genus name, *Belontia*, was derived from the native name for *B. hasselti*, *Belontja* and first defined by Myers in 1923. Since the two species in question were discovered in the mid 19th century this may seem a bit anomalous, but in fact, Myers changed the previous inappropriate name, *Polyacanthus*, to its now accepted genus name, *Belontia*. (It seems taxonomists are always busy among the bottles of preserved specimens in museum archives and are always ready to throw us into confusion as instanced by the recent *Betta/Pseudobetta/Pariocephalus* controversy.) One of the characteristics of this genus is the division of the ventral fins into two filaments.

### *Belontia hasselti*, the Honeycomb Combtail, is difficult to sex

It was *Belontia hasselti* that was described first by Cuvier in 1831 and named after van Hasselt, (who presumably had a hand in its discovery). Its common name, Honeycomb Combtail, derives from the characteristic pattern in the caudal, dorsal and anal fins of both sexes. This pattern is also evident in finer outline on a brown background over the fish's body, the other characteristic marking being a large black spot toward the rear of the dorsal fin. Sexing is difficult, the male being perhaps a little thinner with longer and better marked fins but both sexes possess elongate fins so the criteria used, for instance in sexing *Colisa* or *Trichogaster* spp, are not appropriate. The best idea is to bring on 4-5 young fish together and let a pair bond develop

naturally. The entry on this species in the TFH looseleaf is, in my opinion, incorrect in that the difference between sexes which it illustrates is only the difference between the normal and 'fright pattern' colouration of the adults when a marbling pattern becomes evident.

*B. hasselti* comes from Malaysia, Borneo, Sumatra and was also recently found in Java where it inhabits slow flowing and very clear waters according to Dieter

(77F). Five to seven hundred young may result. In Herr Noak's account the fish spawned five times in three months. Several of the German sources which I have drawn on for this account mention that the fish has a habit of lying on its side when frightened, as if mortally afflicted. I must say I have not observed this although my tanks have plenty of refuges which may serve to reduce this possibly stress-induced reaction.



*Belontia hasselti* showing fright pattern, not sexual differentiation.

Schaller. This beast can grow to 20 cm (8 in.) and, because of its size and aggressiveness, deserves a large aquarium, preferably not less than 100 litres (30 gals).

I have been lucky enough to obtain a few of this species from Lynwood Fish House in Tolworth who in turn imported them from Germany. I can, therefore, confirm from first-hand observation that these are very aggressive fish, at least when young. Thirty of them in a small tank in the retailer's were defending little territories about the same radius as their body length, in fact behaving rather like Damsel Fish. It was also initially impossible to keep the four 4 cm (1.5 in.) long juveniles together in a 60 cm (2 foot tank). Similarly, they bullied other species of fish of similar size but ignored much smaller species. Provision of many hiding places in the form of flowerpots corrected this incompatibility in limited space.

The fish will exist between 20-30°C, (70-85F) eating virtually anything, including small fish, that it can manage to swallow, and breeds at around 28°C, (82F). Wolfgang Noak has described the fish building an 8 cm (3 in.) bubble nest and spawning in the morning; other authorities mention only scattered bubbles. The nest is often built in the corner of the tank or under floating material. After the male has embraced the female he may gather the scattered floating eggs which hatch after 2-3 days at 25°C,

The second species, *Belontia signata*, is confined to (Sri Lanka) and was described by Gunther in 1861. Moyle and Senayake have described it as one of the 10 commonest Sri Lankan fish, occurring in a variety of habitats. It is a good coloniser and its aggression may allow it to obtain food by driving away smaller fish. Deraniyagala says the fish live in colonies between underwater roots but Benl and Terofal have defined three varying forms of this species from different regions on the island so it may be dangerous to generalise about habitat or behaviour.

The rays of the caudal fin are black and extended like the teeth of a comb, hence its common name, Ceylon Combtail. Its base colour varies between dark brown to fiery orange or red. The caudal fin is tinged noticeably with light blue as, less noticeably, are the dorsal and anal fins. The chest is mottled with blue or green and the forward edge of the anal fin is black. There is also a prominent black spot on the pectorals. When the fish are displaying or frightened dark, broad bands become visible on their flanks.

Sexing is as difficult as with *B. hasselti*, the male perhaps being a more intense red, but distinctions are very subtle. I was lucky with my first pair as they displayed a pair bond in the dealer's tank. These bold fish bred only 2 days after purchase at 27°C (80°F) at a size of 7.5 cm (3 ins.)

in 60 cm (2 foot) tank. (They can, however achieve 15 cm (6 ins.) so a 3 foot (90 cm) tank is more appropriate). The male builds a scattered nest of large bubbles and coaxes the female to the nest where a series of embraces occur in which she is inverted. About 30 large eggs are laid at each embrace and up to 500 can accumulate. These hatch after about 1½ days, producing jet-black fry that are much larger than most anabantoid 'larvae'. These are easy to raise, growing quickly on the usual fry food progression from infusoria to fine flake and small crustaceans. Within a fortnight they will usually be about 1 cm and display a black spot at the rear of the dorsal fin, like *B. hasselti*. All through the development of the young fish the adults will protect them although, as occurred with my fish, the male may drive the female away in small tanks. Interestingly, Chris and Denise Brook noted that captive-bred fish were never as colourful as their wild caught adults, a dietary problem perhaps. Breeding these fish then is no problem, the real difficulty is disposing of the young. This is hard to understand when you consider the qualities of this fish I espoused at the start of this article. I was glad to note an individual of this species gained a 'best in show' at the Hounslow A.S. Open Show in 1984. Perhaps it will be the start of a new popularity.

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# What's your opinion?

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



## Spending spree

I had a bit of a bonanza today and splashed out on some new fish for some of my tanks. I bought a pair of dark blue and a pair of red guppies; plus a red female and a blue male platy; four pencilfishes; a pair of flying foxes; and a pair of clown *Plecostomus*. I've never kept either of the latter two species before and must say they appealed a lot to me in the shop; indeed, a customer who arrived just after I had bagged my clown *Plecostomus* asked if they were for sale. I hope to photograph the fish soon: perhaps I'll be able to include pictures of some of them in this month's feature.

Happy New Year! I hope you find health, wealth, peace and happiness in 1986.

## Inertia overcome

Mr. John H. Jenner lives at 49 Linzee Road, Hornsey, London, N.8. He writes: "Although I have been a regular subscriber to this magazine for eight years, and an intermittent reader for much longer, I'm sorry to say that this is part of my first letter to *W.Y.O.* I have often felt the urge to write on previous occasions but inertia ruled. I have five tanks set up at the moment: two 36 in. x 18 in. x 18 in., one of which contains cardinals, red-nosed characins, and a variety of *Otocinclus* and *Corydoras*, sharing with a red-tailed shark. The other is stocked with Congo tetras, upside-down catfish and a lone *Mormyrid*—exact type unknown. Another tank, 36 in. x 12 in. x 15 in. in size contains brown acara that have spawned just recently—again. I shall probably end up by feeding them to our red-eared terrapin. He is housed in a

24 in. x 12 in. x 15 in. tank at the moment though if he does go on growing as fast as he has been a larger tank will soon be required. I would never keep any of the so-called fancy types—except for colour variations—as all those bulging eyes, distended heads and fins elongated to such a degree that the poor fish can't even swim properly, seem obscene and unnatural to me.

## Cryptocoryne success

"I don't cultivate *Cubomba* in any of my tanks but am relatively successful with *Cryptocoryne* species—especially *C. affinis*. It is a slow starter but once established propagates rapidly by runners and does not appear to be fussy about water conditions as long as the leaves are free of algae, temperature is kept below 80°F and top lighting is not too brilliant. Otherwise it quickly falls foul of what I believe is commonly called *Cryptocoryne* disease, i.e. the leaves and stem turn gelatinous, then decompose.

"Amazon swords also grow well for me, producing runners of little plantlets three or four times a year with lush foliage. Similar to you, Mr. Whitehead (*sic.*), I have found that plants that have been thriving for years in a tank will suddenly go into decline and prove difficult to re-establish. None of the tanks receive any natural light from above.

"Power filters operate in all my tanks as I find them more efficient, quieter and easier to maintain than air pumps, polyfilters and undergravel plates. In seven years not one has failed. For some reason I never seem to buy the same piece of equipment twice, now having a different model in each tank—respectively: an Eheim 2008, Martin 300, Sicce F42/32 and Eheim 2007. They are never switched off except to be cleaned.

"I don't worry about temperature fluctuations in my tanks—nor do my fish, as far as I can establish, which is just as well because regardless of manufacturers' claims for their products to be accurate within one degree, I've not found one that will keep the temperature to within two degrees either side of the set figure. Temperature fluctuations should not be sudden, of course, though having said that, in the wild there is often heat stratification in lakes, rivers, etc., yet fish don't always stick within one band. My tanks are all lit by fluorescent tubes,

either Gro-Lux or North-Light type. Each 36 in. x 18 in. tank contains one of each type.

## Escapee terrapin

"My terrapin has led an eventful and interesting life. It was caught by a young man fishing in the River Lee by rod and line. The Lee is a river in N.E. London feeding into the Thames. I am not sure precisely where the terrapin was caught but interestingly the area around Hackney has water warmed via cooling the local power station. I should think the terrapin is an escapee but he could have been deliberately let loose in that section, I suppose. Not knowing just how long his freedom has lasted, I have the problem of deciding whether or not it will be safe to let him hibernate or keep him active in a heated tank. It is a male, judging by the length of its tail and hind claws. The carapace length is 14 cm. so he's possibly around four years old. He has a voracious appetite for snails—both land and water—worms, woodlice and cat-food, but does not seem much interested in plant matter of any kind.

Apart from your column the regular feature that I always read with pleasure and interest is *From a Naturalist's Notebook*. Eric Hardy is so well informed on the wider aspects of natural history that I would very much like to know more about him. The picture used to head his column looks quite ancient. Is that really a Kodak Brownie box camera he—if that is Mr. Hardy—is holding?"

No doubt some thermostats can control water temperature very accurately—especially under controlled conditions, as opposed to the average living, sitting or bed-room in which aquaria are kept—but fortunately fish do not need very accurate temperature control of their environment; indeed, there are those who consider that fish are much healthier if kept in an environment where there is a reasonable fluctuation in the water temperature over periods of time.

## Soft water

Dr. Neville Carrington, of Interpet, wrote to say that now he is using soft water with peat the Indian fern I sent him appears to be taking over. The Java fern is also more than holding its own, as is the Java moss. Neville hopes

to send me some photographs when time permits. What he did send me, at my suggestion, was a coloured brochure showing the range of Plantastics plastic aquarium plants available—plus, under separate cover, a sample of a medium sized Amazon sword plant. The plant is now sited in my 24 in. × 12 in. × 12 in. angel aquarium, together with some Java Indian fern. The tank seems unable to support plants actually growing in the gravel—possibly because the angels uproot them. It's strange because my five other tanks grow plants like forests and occasionally I have to clear out a full bucket of plants. Ironically, a planted



Golden Barb. Have you kept this species?

30 in. × 15 in. × 15 in. tank housing a few gouramis grew excellent plants prior to my introducing four large angels from the angel tank; and the plants continue to grow just as well with the angels and the gouramis together.

The Plantastics medium-sized Amazon sword plant from Neville looked most realistic in its box, and out of its box. What did surprise me was the ease with which I managed to get it sited in the aquarium gravel—and how realistic it looks in place. I suspect that a slight growth of algae on the plant will make it look just like a real plant. Perhaps the angels may decide to spawn on it—which is why I choose an Amazon sword. Incidentally, I was highly amused to see that the small package sent to me from Interpet had attached beside the stamps and the address a green, Customs declaration form describing the contents as being a plastic aquarium plant. Since Neville is well aware that Northern Ireland remains part of the United Kingdom, I must assume that someone at a Dorking Post Office didn't know. It amazes me when—and it happens not infrequently—some people on the mainland show that they don't know that N. Ireland is part of the U.K.—and that despite The Troubles featuring on the

national news headlines almost every morning and evening for about 16 years. "Queen Victoria's dead," as they say.

#### Back-siphoning pump

A couple of weeks have passed since I wrote the previous part of my article; and a family bereavement has left me a little confused about what I've already told you this month. Over a year ago I told you about a filter starting a back siphon into my Zoobeko pump. As a result I sited my Zoobeko higher than the highest of my four tanks. A few days ago, while in my bedroom, I heard dripping water. A quick investigation showed that the two upper tanks had started to back siphon into the two lower tanks. Gallons of water had already soaked my carpet before I made the discovery. Where can I obtain four inexpensive little valves that will prevent this from happening?

It amazes me to see that in my garden, after a beautiful, sunny week in early November, laburnum, broom, primroses, polyanthus and roses are all blooming happily—with more usual plants as well. I had to cut my lawns this week as well—and growth continues in golden privet hedges as well as grass. Indoors, house plants thrive; and the plants in five of my six tanks have almost smothered the fish. I must weed the tanks—and my garden. It always astonishes me to learn that some readers cannot grow plants. Mine get nothing but occasional light from one or two Woolworth's light bulbs. I suspect that many people keep tanks too clean and change water too often. Plants—and quite often fish—flourish best when left undisturbed.

#### Tank in the hall

"Dear Barry," writes 13-year-old Mathew Bradby, of 91 Knightbow Road, Harborne, Birmingham. (You got the first and last letters of my Christian name correct, Mathew.) Our young correspondent goes on to say: "I wish to tell you of my new plans for our tank in the hall. I am going to clean it out totally in half-term, then put most of the fish in the day-unit tank at my father's hospital. I am in split minds as to which fish I will restock it with: either small cichlids, tetras and barbs; or tetras, catfish and various killifishes. The second collection is obviously more challenging, but also more expensive. I have a pair of *A. gardneri* in my front-room one-metre tank and both fish thrive. I don't know a lot about killies but I'm looking out for books

about them. I hope to join the British Killifish Association. I love the picture of your lace gourami in the October *Aquarist*. It has persuaded me to buy a pair. I also want a pair of neon, dwarf gouramis. Labyrinth fish are amongst my favourites and my Siamese fighters have recently bred.

"Livebearers are my other great favourites. I am on the look-out for some hi-fin and lyretail varieties of swords and platies. I have great difficulty in finding any. I suppose I am in the wrong area to join S.L.A.G.—as you point out, not the best name for a society.

"I am very sad to hear about your two old clowns. I know what it is like to lose one: I have lost eight—admittedly just one inch ones. I noted your mention of 'bored teenage pupils'. I am a teenage pupil, but never bored. I have to spend too much time on fishkeeping. Keep up the good work." I'm glad you liked my photograph of the lace gourami, Mathew. I enjoyed the November issue of *Aquarist & Pondkeeper* and was pleased to find W.Y.O. as the first article in the new, improved, enlarged (A4) magazine. Unfortunately the gremlins nicked my name and left me only two large full stops, and exclamation mark and a question mark, in a box. I suppose that if readers do not know my name after 22 years as a contributor (my very first article appeared in the February 1964 issue) I've been wasting my time.



Black Widow. Tips on their care welcomed

Please send me your opinions and tips on the following for a future feature: (a) under-gravel filters; (b) feeding aquarium plants; (c) golden barbs (photograph 1); (d) black widows (photograph 2); (e) non-flake dried foods; and (f) marine aquaria. I hope that you'll write to me. Goodbye until next time—and my thanks to all who have written to me in my 22 years as a contributor.

# News



## London Zoo Aquarium

Readers of this magazine will be familiar with Dr. Chris Andrews and his work at the Tetra Information Centre. However, Dr. Andrews has now been appointed Assistant Curator (in charge of the aquarium) at London Zoo, and has left the Information Centre (as of 1st December 1985).

"I have enjoyed tremendously the last eight years at the Tetra Information Centre and, of course, I am leaving with some feelings of regret. However, I am looking forward to the challenge of this exciting position at London Zoo, where a number of changes are planned for the aquarium," said Dr. Andrews.

Chris will continue to write for the monthly aquatic magazines, and intends to maintain his many contacts throughout the U.K. hobby. He can be contacted at the Zoological Society of London (Aquarium), Regents Park, London NW1 4RY (tel: 01-722 3333).

All mail for the Tetra Information Centre should be addressed to Tetra Fish Care, Mitchill House, Southampton Road, Eastleigh, Hants SO5 5RY, where a replacement for Dr. Andrews will be appointed shortly. All mail sent to the Tetra address in York will be forwarded to Eastleigh.

## Aquarium owners—filter your water with Brita.

Brita helps you to look after your aquarium so that fish can live in the freshest of water. Softer water is a more

natural climate for fish, as the temporary hardness and chlorine is removed, leaving you with a cleaner aquarium that stays clean longer.

Brita water tastes and looks like bottled water—at a fraction of the price. For only 4 pence a litre the Brita filter jug will free your tap water from those elements that cause scum in your tea, fur in your kettle, and ugly, hard-to-remove rings of film on your crockery. With Brita water you can see the difference in the clarity and natural colour of your tea, and taste it.

The Brita water filter removes any taste of chlorine temporary hardness of tap water, traces of heavy metals, taint and cloudiness so noticeable in drinks. Ice-cubes leave no residue at the bottom or sides of the glass; plants thrive and flowers last longer, and the improvement can be tasted and seen in your cooking. Imagine, you never have to descale a kettle again!



Brita takes away the impurities, but leaves intact vital minerals and trace elements that are essential to you, your family and pets. Consequently not only do your soups, sauces, drinks and cooking look and taste better, but they contain more goodness, no impurities. With Brita you are taking no chances with your health and cooking with the best.

The Brita filter looks like an attractive table-jug, in either red or brown, simple to use, just slip the replaceable cartridge into the centre of the jug and fill with cold tap water. The cartridge (£1.99) filters 60-100 litres, usually one month's supply.

The Brita water filter jug is available from all department stores or mail-order from Brita (UK) Ltd, 51 Ashley Road, Walton-on-Thames, Surrey, KT12 1HG at £9.95 plus £1.90 p&p.

Please contact this office if you would

like to try a Brita.

Sally Mordant and Susan Morris; 86 Gloucester Place, London W1. Tel: 01-935 6878.

## Electronic Temperature Instruments

would like to announce the launch of a new product, a clinical/veterinary thermometer having a digital LCD readout display. The thermometer will measure temperature in the range 32°C (89.6°F) to 43°C (107°F). This is the biomedical temperature range, and the thermometer is accurate only within this range. If the measured temperature is outside this range then the display will only read 'L' or 'H' (for Low or High as appropriate). The display 'blinks' at a rate of 1Hz. There is also a peak hold function, where the peak value measured is held and displayed until power is turned off. If the thermometer is inadvertently left on, it will turn itself off after about 7 minutes. Instructions are also supplied. Size 137 mm long, × 16 mm wide × 7 mm thick. Weight 13 grams.



The thermometer does not require maintenance other than cleaning which may be done with a damp cloth or luke-warm soapy water. Medical alcohol may be used for sterilising the sensing tip of the thermometer if required. ETI can also supply disposable sterile sheaths which are custom made to fit the model. Apart from normal clinical/veterinary applications the thermometer is ideal for fertility testing where a 0.2°C change in temper-

ature can be detected at ovulation.  
Price: £8.95 each.

#### New range of application kits from Stuart Turner for Water Nymph 280

The Water Nymph 280, Stuart Turner's contender in the garden submersible pump marketplace, is now available in a range of pre-packed kits covering a variety of applications. They are: pump only; waterfall only; fountain only; and combined fountain and waterfall.

Each kit is packed in a polystyrene inner with an attractive full-colour label for shelf display; the packs are also shrink-wrapped in clear film. The pump-only kit comprises a mains voltage Water Nymph 280



with plastic strainer and five metres of electric cable. The fountain kit also includes a plastic fountain jet; the waterfall version comes complete with plastic hose; and the combined waterfall and fountain kit is supplied with all these components, plus an adjustable fountain jet with waterfall tee-piece.

Performance for the Water Nymph 280 is 375 gph at a 2 ft. head and 150 gph at an 8 ft. head; maximum head is 10 ft. and a Stuart Turner fountain jet produces at display to a maximum height of 7 ft. The Water Nymph 280 is guaranteed for two years and requires no preventative maintenance during the course of a normal working life beyond periodic cleaning of the strainer. The motor incorporates a thermal cut-out to terminate operation if the temperature rises; the pump automatically restarts after the temperature has dropped to within safe limits.

A magnetic drive is employed to eliminate shaft seals and each unit is electronically tested during assembly for pressure tightness.

#### Encouraging the beginner to enter the world of water gardening

The diversity of materials needed to start a water garden can deter potential newcomers to the hobby. Now Lotus have introduced a kit that contains the basics for creating a garden pool. Aimed at the first-time impulse buyer, the Lotus Garden Pool Kit is attractively packaged in a colourful box with carry handle and, Lotus believe, will persuade the water gardener of the future to make an immediate start.

The kit contains a 10 ft. x 8 ft. PVC liner, a Baby Otter submersible pump and



a Kingfisher artificial stone fountain ornament and comes complete with instructions in four languages on how to construct a pool in a weekend. The eye-catching packaging features a picture of a finished pool.

"Our pool kit has been introduced in response to a real need," says Lotus managing director Joe Kindler. "Retailers of Lotus products have frequently commented on the consumer resistance to buying several components for their first pool. We think that the Garden Pool Kit goes a long way in overcoming that resistance. A dummy kit that we showed for the first time to a selection of buyers at GLEE inspired some very enthusiastic comments and we at Lotus think it will be a big seller in the 1986 season."

#### The L.M.B. Paludarium

MANY visitors to the Aquarian Fish-keeping Exhibition at Kempton Park in June of last year were impressed by the unusual and very attractive paludarium presented by Wuppertal T.A.S. from West Germany as their entry in the tableau competition.

Paludaria combine aquatics and exotic plant cultivation "all under one roof" (as it were) and have long been popular

on the Continent, particularly in countries such as Holland and West Germany. However, they have never been readily available in U.K. in the past.

This situation has now been rectified by L.M.B. Aquatics of Manchester who launched their own design at last year's Yorkshire Aquarist Festival and have been receiving a healthy stream of orders ever since.

The L.M.B. Paludarium consists of a 5ft-tall cabinet/showcase subdivided into three main sections.

#### a. Top Section

This hinged section contains fluorescent tubes housed above a patterned glass base to diffuse the light shining on the plants.

#### b. Central Section

This glass-fronted section is designed in two parts. The upper (aerial) part houses the plants—exotic and/or heat, moisture and light-loving plants such as bromeliads, orchids, ivies, etc. The lower part consists of an all-glass aquarium located below a plant "shelf". The tank comes complete with a heater/stat and internal power filter.

#### c. Bottom Section

This consists of a cupboard containing the control switches and can be fitted with an automatic timer as an optional extra.

All Trade and Retail enquiries should be addressed to:

L.M.B. Aquatics (Wholesale & Retail), 748 Oldham Road, Failsworth, Manchester, M35 9FE.  
Tel. 061-682 6083 or 0422 47609.

## Next month

**The Piranhas.** Piranhas are causing some concern in the U.S.A., some species having appeared in North American Waters. Dr. Robert Goldstein reports on this and describes some of the Piranha species involved.

**An Intriguing Mouthbrooding Betta.** David Armitage writes of his breeding success with *Betta unimaculata*, known to Science since 1905 but only recently first seen in this country.

**The Hump-backed Limia** is an easy livebearing toothcarp to keep, says Peer Koppenaar who encourages aquarist to breed it and increase its present sparse availability.

**Spotlight: The Upsidedown Catfish.** Dr. Michael Benjamin describes the adaptations leading to this fish's inverted mode of existence.

**Marine Angelfishes.** Surely comprising the aristocrats of saltwater species, the Angelfishes are viewed by most aquarists as the ultimate in flamboyance and colour. Stephen Sawyer writes of some of his favourites.

**Fireside Reading for the Coldwater Fishkeeper.** A quiet time for the Coldwater enthusiast, early spring is a good time to examine some of the current literature on this aspect of the hobby. A résumé by Stephen Smith.

These are just a few of the features in our next issue but with much more of interest to aquarists, whatever their particular speciality.

# PETE'S PONDS ARE OFF TO A TEE!

A nine hole pitch and putt course with ornamental ponds.  
Written and illustrated by Stephen Smith



Looking downstream towards the second and third ponds, linked by a watercourse which runs underneath the fairway. To the top of the picture the trees themselves grow on the banks of a small river at the foot of the slope.

Worcestershire businessman Pete Thompson has never made a secret of the fact that he is a keen golfer. So it was no surprise when he decided to re-design his garden into a nine-hole pitch and putt course. And to add to the setting he installed not one pond but three—all linked by a natural stream, thus providing my idea of heaven in coldwater pondkeeping.

Pete has lived near the Malvern Hills in his cottage with his wife Irene, 'The Boss,' for over 25 years. Two years ago he decided to landscape the orchard bank sloping down from the house to a small river. Naturally enough, there had to be a miniature golf course, and over the years he has become quite an expert 'green-keeper'.

"Somehow," explained Pete, "the sight of water always seems to put even the best golfers off their stroke—so I just had to include the odd pond in the course!"

"The odd pond" turned out to be a major exercise which eventually incorporated three water-havens each approximately ten feet in diameter and three feet deep. The concrete lined structures and the natural looking water-channels were all built within a matter of months; and the stream, which used to run alongside the orchard from a natural spring in the hill above the house, was diverted through its new course before flowing into the river.

"The only problem we have is that the spring dries up around the end of August so we have to use a pump from the bottom pond to circulate the water during the Autumn, topping up occasionally from the river," Pete continued. "We don't have any mains water at all—but you should see the fish . . ."

I was greeted at the first pond by the gaping mouth of the biggest Shubunkin I have ever seen. Resplendent with its bright red and black colouring it would have been quite at home in any Koi establishment. Numerous young comets, common goldfish and fancies soon joined the giant at the feeding ring, and a handful of pellets were devoured almost instantly.

Similar fish were accommodated in the second pond, while young fish from this year's spawning flitted around the fountain in the lowest pond.

I was particularly impressed by the amount and variety of plants in the ponds, and although Irene was about to thin them out I felt sure that she would have few of the problems which are encountered in 'static' ponds.

I'm looking forward to next Spring, even though my mind will without doubt wander away from the green of the turf just as I'm about to play that winning shot . . . !

# Your questions answered

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

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



**TROPICAL**  
Dr. David Ford



**COLDWATER**  
Arthur Boarder



**PLANTS**  
Vivian De Thabrew



**KOI**  
Roger Cleaver



**MARINE**  
Graham Cox



**DISCUS**  
Eberhard Schulze

## Coldwater

### Lining a pond

I intend to line a garden pond and would like to know how long I should leave the water to settle down before adding the fishes?

If you wash the liner first to remove any dust etc., from it, the water should be quite safe to add fishes the same day as the pond was filled. This can be done if the fishes have been kept in a holding tank for a time. However, if the fishes have not been obtained, then the pond can be left for a couple of days before putting the fishes in. Some years ago I lined an old pond with a butyl liner and put the fishes back the same evening, and no trouble was evident.

### Flukes

My goldfish in the pond have been attacked by Flukes. I think that I have cleared the fishes of them but wonder if I should empty the pond next spring and let it dry out for three weeks or so to kill any eggs remaining?

I do not think that there would be any benefit in emptying the pond. The flukes do not lay eggs in the pond as do Fish lice (*Argulus*). There are two main species of Fluke which attack goldfish; *Gyrodactylus* and *Dactylogyrus*. The latter are egg layers and the young can swim around until they find another host. If they cannot find one in a short space of time they die. *Gyrodactylus* are live-bearers and the young are borne singly and remain on the body of the fish until perhaps they are brushed off when contact is made

with another fish. It is said that the young one can be seen with a microscope's aid, inside the parent and even another inside that.

### Fancy goldfish

I would like to breed a show quality fancy goldfish, but am unable to buy top quality fish as their owners will not part with them. If I buy young fishes from a very good strain, but which are not up to show standard, do you think that in time I can produce some good youngsters from them?

If you buy some youngsters from a breeder who has a very good strain of fishes, then as long as you are prepared to have plenty of patience, you should be able to produce much better young fishes if you choose carefully from each spawning and only keep those fishes for further breeding which are as near to the standard as possible. It may take a few years but it is almost certain that from each spawning you will be able to pick out a few fishes which will give you the results you require. The quality of the strain from which you get the fishes will be sure to turn up in at least a few of the offspring.

### Siting a pond

I intend to make a garden pond and would like some advice on positioning it. I would like it near the house but I am afraid it would bring mosquitos near us. I have a fair sized garden.

There is no need to worry about mosquitos as two to three fishes in the pond would ensure that no mosquito larva would reach maturity as they would soon be eaten. It is an advantage to have the pond near the house so that the

beauty of water lily flowers, etc., can be seen. Also it is better to be near a source of water for topping up or refilling. If it is intended to use any electricity for heater, fountain or waterfall, it will lessen the length of cable. If there is a higher part to the garden it is an advantage to site the pond there as it will make it easier to empty the pond if necessary, even by siphoning the water out. A low lying pond can have rain water drain into it which could be dangerous.

### Sexing Tench

When do Tench spawn and how can I sex them?

The times given by some authorities vary from March to September. The close season in this country for coarse fish is from 15th March to 15th June, both days inclusive. Nowever, I have bred Tench (*Tinca tinca*) in my garden pond for several years, but they never spawned before July. The average time was mid-July. I know that they were kept under artificial conditions but I would think this would be an advantage as they were never short of live foods, especially earth worms. Also I suspect that the water in my pond would have warmed up sooner in the year than water in the wild.

I found that I had the best results with two males to one female. I have seen it in print that it is difficult to sex these fishes, but I have never had any difficulty. The pelvic fins of the male are almost spoon-shaped, with a distinct concave appearance, with the outer rays very much thickened. I am sure that these strong fins are used to press the body of the females when encouraging them to spawn. The chasing is very vigorous and the excited males may splash above the surface. The eggs are similar to those of the goldfish but very slightly larger and adhere to water plants, etc. At a couple of



months of age the youngsters are very attractive with a bluish sheen on the front of the body and a small triangular black patch on the caudal peduncle. I have had my two year old youngsters spawn successfully.

## Koi Unclear water

My Koi pond is 12 ft. square and approximately 5 ft. deep with a bottom drain. Capacity is approximately 2,900 to 3,000 gallons. Filtration is via a Cyprio 4 Cartridge foam filter and then through two chambers, each approximately 4 ft. long by 3 ft. wide, containing coke and acting as a biological filter. Water is drawn through by a submersible pump in the second chamber and fed into the pond with a Venturi. The output of the pump is approximately 1,200 gallons per hour. My problem is that I am unable to keep the water clear and cannot see below 1 ft. of the surface. (The coke in the chamber is approximately 12 inches deep). I open the bottom drain 4-5 times per week and remove approximately 150 gallons each time. I have 20 Koi in the pond approximately 18 ins. long and eight approximately 10 ins. long. I have been advised to replace the coke with Canterbury Spa chippings as this is more efficient. Do you think this would be the answer? I would also like to know how often the bottom drain should be opened and approximately how much water to replace. I do hope you can assist with this problem as I am unable to see the fish other than when they feed. The pond is approximately 18 months old.

I have had no actual experience of using coke as a filter material but after making some enquiries I understand that due to its nature the surface of coke quickly becomes choked with muck and suspended matter in the water. This prevents an adequate growth of bacteria for a biological action to take place effectively. Therefore in your case a change in filter material should be beneficial.

Canterbury Spa is a very good material for the reason that it provides a large surface area of filter for the bacteria to build up on. The size of your filter should be adequate for your pool size and pump capacity.

No hard and fast rules apply to how much and how often bottom drains should be drawn, but the usual recommendations are that 10% of your pool water should be discarded daily. Some Japanese even do far more than this minimum change on the figures you put in your letter.

At present you are only changing 5% and even then not daily. These water conditions can be maintained by the above recommendations for the summer months only. During winter only 10% needs to be changed weekly.

## Pond filter

I am in the process of constructing a Koi pond (16 ft. x 7 ft. x 3 ft. deep) and would be pleased if you could give details of how to build an under-gravel filter inside and outside of the pond. I am unable to put bottom drains in because of cost. So could you give details of ways to clean sludge from the bottom of the pond. Is it bad to over-filter a pond and what is your opinion of the Lea Valley filters from Q10 Aquatics?

Taking your last point first. It is not really possible to over filter a pool, no matter how large your filter may be. After a certain size, however, the actual benefit gained is negligible. As to the use of Lea Valley filters, I personally own a small one and I have used it for many years on a small Koi pool very successfully. The thing to bear in mind with commercial filters is to make sure that you do not exceed the recommended flow rate through them. Also, make sure that your pool is smaller than the pool size that they are for use on.

I enclose some drawings which show how to construct filters both external and under-gravel, which I hope will be of some use to you. The actual method of construction is very variable.

To work out the size of filter you need, apply one of the following:

1. For under-gravel filters: Filter bed size equals 30% or more of your pool size.

2. For external filters: Filter area in sq. ft equals output of pump in gallons per hour, divided by 60.

If you use under-gravel filtration bear in mind that it must never be switched off. External filters may be switched off to back wash them, but should be turned back on as soon as possible to prevent the bacteria from dying.

As for your second point of removing muck: The only way of keeping the

bottoms of ponds clean without bottom drains is by mechanical means. Several good vacuum pumps are now being sold and I would recommend that you get in touch with one of the large Koi stockists to obtain details of these pumps. Unfortunately, they are rather expensive.

## Tropical

### Cold Tropicals?

I would be very grateful if you would help me. At the moment I have three tropical aquaria housing Mollies, Swords, Catfish, Clown loach and so on, but I am interested in keeping tropical coldwater fish in one of the aquariums. The thing is that I am unable to find a good book which illustrates the different kinds of tropical coldwater fish which are available. If you can suggest a book it would be appreciated. I have been trying to get a book on tropical coldwater fish for some time but all the books I have seen are on Goldfish, Koi, etc., which I am not keen on for an indoor aquarium.

You ask about "Tropical Coldwater" fish, but this is a contradiction in terms. I think you mean what coldwater fish are available for the home aquarium other than Goldfish.

Young Koi will remain small in an aquarium and develop into lively, colourful fish. Mirror Carp too will live in aquaria, and Crucian Carp, Chub, Bleak, Tench and of course Minnows and Sticklebacks. Foreign fish (which is perhaps what you really mean) that can be kept in unheated tanks include American Sunfish such as the Blue Spot, Orange Spot and Black Banded Sunfishes. The North American Catfish and Stone Catfish live in cool waters. Paradise fish will live and breed (bubble nesters), in cool aquaria. Bitterlings are another favourite coldwater breeding fish. In a constantly warm living room an unheated tank can be used for most tropicals—especially hardy species such as the Guppy and White Cloud Mountain Minnows.

## Climbing Perch

Can you tell me about my Climbing Perch? I have a pair in a 3 foot tank with rocks, bog wood, plants, etc. The female is gravid. Can you tell me the breeding habits and about looking after the fry?

Also could you tell me how to get

rid of some live, breeding *Daphnia*. I have some little red fleas on the surface of the water that jump up and down. How can I get rid of these because the Climbing Perch do not seem to eat them?

The Climbing Perch is *Anabas testudineus* found widely in South Eastern Countries where it lives in swamp waters that dry up. It 'waddles' from one pool to another, hence the 'Climbing' name. The fish is an aggressive carnivore, quite unsuitable for the community tank, but on its own in an aquarium or vivarium it is easy to keep. A good lid is necessary or it will climb out of the tank.

Males are a darker colour, so if you have a true pair they should breed when your gravid female is ready. No special conditions are needed and the eggs are ignored by the parents. Within two days all the eggs will have hatched into probably dozens and dozens of extremely hungry fry. They will eat carnivore flake, shrimp, beef, fish, etc., etc. and grow rapidly. You will then need dozens of aquaria too, to prevent overcrowding.

The fry will soon remove the *Daphnia* and surface insects for you. If the Perch do not breed, then remove the insects with a fine mesh fry net. A good power filter will also remove them.

## Differing species

I have a Texas Cichlid about 4½ inches in length and also a Red Devil which is the female, she is about 3½ inches in length. They are both in an aquarium which is 48 in. × 12 in. × 15 in. with both rocks and vegetation.

They have bred about eight times this year, but the eggs have either fungused or disappeared, presumed eaten.

Is it possible for you to give me any advice on how I may be successful in hatching a batch of eggs?

The Texas Cichlid is *Cichlasoma cyanoguttatum*, whereas the Red Devil is *Cichlasoma erythraeum* (or *citrinellum*) and although of the same genus they are different species and hence (by definition) will not inter-breed. I have never heard of a hybrid of these species, so I expect the eggs are unfertilised. You must get either a female Texas Cichlid or a male Red Devil.

## Clarius catfish

I have bought a 7 in. catfish. The name given to this fish was 'Poldens Vergate'. I have tried to find information about the fish in my books but the nearest I have got is a fish in 'The Hamlyn Guide to Aquarium Fishes' and it belongs to the family Clariidae and is called '*Clarius batrachus*'. 'Poldens Vergate' looks the same as this fish except for colour. It is black, pink, white and light brown.

The shop owner says he bought it from someone who had bred it and had one to many, and it is a male. Could you please give me some information on this fabulous fish?

The fish you possess belongs to the Clariidae family. These are Eel-shaped Catfish from Africa and the Far East, and all possess an air breathing organ that allows the fish to live out of water for several hours, and to thrive in poor quality waters.

This means they are undemanding in the home aquaria but are big eaters (anything from worms to potatoes) and can grow large enough to eat the other fish. The fish have not yet been sexed or bred, according to the literature.

The particular fish you own is certainly a *Clarius* but the species may be one of many—or even a cross-breed. Since it looks like a *Clarius batrachus* (Frog Catfish), the species with similar looks are *Clarius angolensis* (Brown Clarius), *Clarius dumerelli* (Barbel Catfish) or *Clarius lasera* (no common name). To identify, compare the shape (and colour) with the diagrams in Sterba's *Freshwater Fishes of the World* (TFH Publications) but if it doesn't quite fit remember it may be a cross-breed. Since there are no publications of any successful breedings the claim that your fish is part of a brood is very interesting—let's have details please!

## Automatic feeder

I am a second year student studying for an OND in technology and have been assigned a project which is a 'feeding mechanism for an outdoor pond system?' I am writing to ask you if there is already such a mechanism on the market (if there is technical data would be useful), and what attributes would you suggest be incorporated in my project?

I do not know of any automatic Pondfish feeders—but there are many models available for automatic Farm Pond feeders, of course. You will get information from the Fish Farm industry.—I suggest starting with Kelvin Hughes Aquaculture Services, New North Road, Hainault, Ilford, Essex IG6 2UR, telephone: 01-500 1020.

I doubt if petfish owners want an auto-feeder. Feeding pondfish, especially Koi, is the major pleasure and only interaction available to hobbyists, so this is done by hand. During summer 'natural' foods are available and in winter the fish hibernates—But good luck with the project.

## Marine

I have a 24 in. × 15 in. × 12 in. marine tank with undergravel filter

powered by a Hagen powerhead and two airstones which run off a Sera pump. The tank has been running for six weeks and since the nitrite level fell three weeks ago to a safe level I have had a 4 in. long Clown Triggerfish installed.

The fish appears healthy, swims well and feeds very well every day on small pieces of whole prawn or mussel. I intend to keep just this one fish in the tank due to the size of the tank, the ultimate size of the fish and the aggressive nature of triggerfish.

The problem is, the fish has one stubborn white spot approximately 1 mm. in diameter on its dorsal fin. I have treated the tank twice over three weeks with the recommended dose of a proprietary remedy for saltwater protozoan disease but the spot refuses to fall off.

Also, when I look closely into the tank, I can see a great number of minute white creatures hopping and running quickly over the algae and rocks/sand, and swimming in the water itself are what appear to be some form of dinoflagellates (1 mm. long and moving with flicking, curling movements). I thought these might be the free-swimming spores of the white-spot so treated with the copper but it hasn't killed them. Should they be in the tank? Are they just healthy plankton or should the water be completely pure for the fish? He doesn't scratch on the rocks or seem irritated though he does chase his reflection in the glass.

I would be very grateful if you could advise me on these minute creatures i.e. are they normal or should I eradicate them anyway and with what, since Coppersafe seems ineffective? Also, how can I get rid of this one white spot which is spoiling the appearance of my fish?

1. Your aquarium is far too small to be run as a successful tropical marine aquarium—unless you will content yourself with a small anemone and a pair of *Amphiprion percula* (common Clownfish). I would never recommend a beginner to marine aquatics to begin with an aquarium smaller than 36 in. × 12 in. × 15 in.—and a tank measuring at least 36 in. × 18 in. × 18 in. (42 Imp. gallons gross) would be safer. Your tank has a gross capacity of only 15½ Imp. gallons (070 litres) and, allowing for freeboard and displacement probably contains no more than 12 Imp. gallons (54.5 litres) of seawater. The biochemical stability of a body of seawater

this small is precarious to say the least!

2. The minute white creatures are saprophytic (i.e. "dead material-eating") harpacticid copepod crustaceans. They are not parasitic—attacking only dead or moribund fishes and invertebrates. They are, however, a great source of irritation to fishes when they bang into them. They should be removed as soon as possible by buying a Mandarin Dragonet which specialises in eating copepods. The most likely source of introduction is by feeding your fishes on non-irradiated seafoods although several other entry routes are possible.

3. The white-spot which you can see on your Clown Triggerfish's dorsal fin is either a monogenetic trematode (i.e. "flake") or the encysted eggs or larva of a fluke. The treatment is "Sterazin" at 2 drops per gallon.

## DISCUS

For some time now I have been considering setting up a Discus only tank. The aquarium I have available is a 6 ft. x 2 ft. x 18 in. all glass tank. The set-up would be more for display in my living room than as a display specially for breeding and would be roughly along the following lines:

Substrate to consist of a bottom layer of peat/sand/fine coarse gravel mixture separated by a gravel-tidy from a top layer of an inch or two of normal pea-type aquarium gravel. The idea behind the peat/sand/gravel mixture is to provide a good rooting base for plants such as Amazon Swords, Myriophyllum and various Cryptocorynes. The gravel-tidy is merely an attempt to keep the peat mixture at the bottom of the tank. Also the peat mixture will I hope act as a buffer to the pH and softness of the water.

Also in the decor would be pieces of bog-wood, flower pots and clay pipes.

Filtration would consist of the external power filter type, probably a Fluval 302, with possibly an air pump for aeration only.

I would greatly appreciate your opinions on the following points: (1) Does the set-up I describe seem suitable for the keeping of Discus? If not what changes would you recommend.

(2) How many adult fish would a tank of this size hold? I intend to stock it at the outset with a mixture of around 18 'Blue', 'Green', and 'Brown' Discus.

(3) If two of the fish pair off, what are the chances of breeding them successfully in a tank this size alongside the other fish?

When reading your answers to queries in the 'Aquarist and Pond-keeper' you regularly advise the use of an Oxydator and Optima filtering material. Could you please send me any further information on these two products, especially the Oxydator as the letters of praise it receives in the Highgate Aquarist adverts make it out to be a most useful addition to any tank set-up.

Although various writers have often suggested the use of peat beneath the gravel in an aquarium as a planting medium, I, for one, really cannot see any point. Peat as such contains very little the plants need initially and since most of the "goodness" has also been removed from the gravel by washing it thoroughly I would suggest the use of one of the available additives like "Terra Bona" or "Ferrogan". These products, or products like it, will certainly give the plants initial start and from my own experience work very well. Peat is a very good substance for use with many tropical fish but it should only be used in a filter where it can be removed or changed easily.

Sand, as a substrate for certain types of plants works very well but it should not be used in a Discus fish aquarium. It can compress too much and will often foul-up. A gravel mixture of 3 to 5 mm will be fine for most plants and will also be suitable as a biological base. Your selection of plants must be looked at again because I do not think that Myriophyllum will do very well in the high temperature needed for the fish. *M. mattogrossense* will also require a lot more light than any of the 'green' varieties and this would not be ideal for the fish. Since a good plant growth is difficult in a Discus fish set-up and since aquatic plants also need a rest-period, you should keep them in either small flower pots or plastic trays so that they could be taken out and kept at a lower temperature in another tank. This would also make the task of pruning, replacing or fertilising that much easier.

An external power filter is the best system anyone can use but I have no comments to make as to your choice for the simple reason that I am not familiar with this brand. I have over

the years only really used Eheim power filters; I know the system, I know the accessories and I also know that it is the most reliable system available today. With the built-in heater/thermostat of the thermo range one doesn't even have to worry anymore that the thermostat will get stuck and boil the fish. Obviously, they are much more expensive but could be one of the best investments ever made. (I have been running a couple now since they were first made available in England; and the temperature is maintained exactly as set.)

Your aquarium will hold approx. 400 litres of water and will take about 8 fully grown Discus fish; if you get a pair out of them and they decide to breed in the tank, the chances of your raising them with the other fish in the tank, are very slim. However, it has happened!

The Oxydator has been hailed all over the world as the fish-keeping innovation of the last few years, yet there are still people about who either through ignorance or other reasons consider it nothing but "rubbish". In fact, one dealer who was asked for several months by one of his customers to get him one insisted, that an airpump (which no doubt, he had in stock), was far better. This well-known dealer in the aquatic trade should have known better. The Oxydator supplies the aquarium with 100% pure oxygen. The airpump, however, will only supply the water with approx. 21% of oxygen since the greater part of air is nitrogen.

But the aquarium needs oxygen to break down organic nitrogenous substances, which are part of any aquarium, into harmless salts. If there is no oxygen in the water, nitrogen cannot be broken down. If the oxygen content of the water is low, the organic compounds decay more slowly and the water is rich with the toxic interim products of ammonia and nitrite. The nitrite will accumulate in the red blood corpuscles and hinder the absorption and transportation of oxygen. It will stunt Discus fish. The oxygen content of Amazonian waters (Rio Negro, Geisler, Wasserkunde), was at 28 to 31 degrees C. 6.62 mg/l. This could never be obtained in an aquarium with any airpump. Oxygen is a very important part of any aquarium set-up; without it, the system will just break down. That is why I share the view of thousands of hobbyists all over the world who have made the Oxydator part of their system in maintaining a healthy environment for their fish.

# Comment by Roy Pinks

I read, somewhere, a plea for guidance from a correspondent on what to do in mid-winter when the power went off and remained off. He must have been a little disgruntled with a reply which suggested that such things did not actually happen. From the security of the Home Counties, perhaps such problems have never been experienced, but those living in the sticks (and I am one of them) sympathise very much with aquarists having tropical tanks to sustain during weather which, to most of us, is unimaginably bad.

In the most vulnerable areas it really pays off to plan very carefully the location of your tanks and their contents. Aquarists sometimes tend to be a trifle careless about the disposition of their resources, and tanks appear in every odd corner of the house, in the shed at the end of the garden, and in the greenhouse, too. In normal circumstances this is all very well, but it is no fun, in the middle of a blinding snow-storm, trying to keep all of them warm, and at the same time looking vainly for the pool heater in the hope that there will be enough power to keep the ice at bay. All very well if the distant tanks are coldwater: the water might freeze solid, but at least the content will probably survive.

Where heated tanks are involved it is obviously sensible to concentrate them in one room which you know you can heat well, and if you have listened to our past advice not to overcrowd your tanks ever, you will have room in them into which you can temporarily move the occupants of those tanks placed in cold spots around the home.

Those who have a "nose" for weather will be in a good position to judge whether a given emergency is likely to persist or not, and I think that the further north you go, the more reliable is the instinct for this sort of thing. Such are the remarkable evolutions of our climate that much of what I have written may sound alarmist, and I would agree that in many winters it has been easier to be wise after the event than to have contributed positively before it. On the other hand it should be remembered that winters yielding three or four months of snow and frost are not uncommon in the north, and even in the south we have encountered appalling conditions during the past 20 years or so. The advice given here will help in two ways. First, to cope

with a power-less period, and secondly, to see the worst weather through with minimal stock losses.

The difficulties begin to pile up when you only have electricity to keep things going, and it is remoter areas where gas, for example, is not available, where a great measure of emergency planning has to be undertaken. The fishkeeper is faced with two main tasks:

- (a) to maintain heating and
- (b) to maintain any necessary aeration, especially in marine tanks.

The matter of lighting is not important, as even if the outage lasts for a week, plants will only suffer a temporary setback, provided that they were well chosen in the first place.

## Heating

If you have a large installation of valuable fish, it might just be worth installing a small generator run by petrol or diesel. If the costing is right, there are numerous models available, but do get professional advice over coupling up. As you can spend up to £1,000 or so on this option, it will remain an unlikely one for the average amateur. The first thing to do is to conserve what heat is available, and wooden or polystyrene panels cut to clip on to exposed glass will help considerably. Blankets or the like heaped on top of tanks will also keep available heat from rising away from them.

Of course, the present trend towards enclosing tanks in prefabricated cabinets will save a lot of work, and if the back is also boarded in, all you need to address is the face of the tank. Given these precautions, the rate of fall in temperature is slowed and steady, characteristics which the majority of fish can accept, provided that the lower limit is not too low. Many fish will merely become inactive down to about 55°F and still recover, but if you aim at keeping 60°F, you should get through. So keep the ambient temperature of the room containing aquaria as high as you can, by using calor gas, paraffin or solid fuel.

On the whole, marine aquaria are normally kept nearer 70°F than above, and their inmates may therefore weather the storm better than freshwater tropicals. It has been suggested that water should be heated by emergency means and then poured gently into each tank. It is always a temptation to overheat this water, so it is safer to have a jam jar

in each tank, into which to pour it and to mix it gently with the surrounding water.

## Aeration

Whether this is strictly necessary will be determined by the degree to which you have overcrowded your tanks, and if you have followed the advice given in this column, you will have left enough spare room for it to be more of a luxury than a vital need. Marine tanks, which generally employ under-gravel filters, come into a different category, and it may be said that it is here that aeration is a real need. A number (but not very many) firms manufacture air pumps capable of working off batteries of a range of voltages, and it is a pity that these are advertised so rarely. But at least such things are available and will provide a service for as long as you can supply batteries to activate them.

Rather more bizarre is the prospect, often suggested, of having a series of car or cycle inner tubes inflated, gently discharging via a control valve, to your tanks. The rate of flow can be quite gentle, a mere fraction of what is customary, as this will keep enough bacteria alive to support the system when things return to normal.

I recall using bicycle pumps to keep my own sub-gravel filters active during the Heath power cuts, but this was rather different from winter's ravages, when the date and time of restoration of grid power is pure guesswork, and depend entirely on the fortunes or otherwise of the heroic workers in the power industry.

These crude arrangements will get you through the worst without serious losses, provided that you remember that whilst these conditions last, your fish will be far less active than usual, and will require minimal food. So, if you see them refusing the small offerings made, just forget it until the next day, by which time their appetites may have improved.

If you can obtain some live food (whiteworm is easy to maintain throughout the year), this is more likely to be accepted and less likely to pollute than dried food, if rejected. If plants, especially the finely leaved species, begin to break up, try to siphon away the debris: in general, the cleanest possible water conditions will reduce your ultimate problems.

# Meet the societies



To countless thousands of aquarists, Belle Vue is synonymous with the highly successful annual British Aquarists' Festival (see the December '85 issue of the *Aquarist & Pondkeeper* for a report of the most recent one).

What many of these thousands will not be aware of is the strong, historical link between B.A.F. and the Belle Vue, Manchester, Aquarium Society. In fact, the association goes back even beyond the very birth of the Festival itself.

Belle Vue, Manchester, Aquarium Society was formed way back in 1936 and, thus, has the honour of being one of the longest established Societies in UK.

It was formed by a devoted group of people who included the then Curator of Belle Vue Zoo, Mr. Gerald Iles. Alas, the Zoo and its Aquarium are no longer in existence, but the Society most certainly is.

B.V.M.A.S. can boast of having had a number of 'colourful' and highly

## Belle Vue, Manchester, Aquarium Society

individual personalities among its members over the years, including that well-known and respected figure, Stan Taylor, who, sadly, died in April 1984 and after whom one of the coveted B.A.F. trophies is named.

Stan was a very active member of the Federation of Northern Aquarium Societies (he was, in fact, their President for several years). To a significant extent, it was the interest and devotion generated by members of the Belle Vue, Manchester, Aquarium Society that contributed to the formation of F.N.A.S.

It was also largely the effort put into the Society's 'One-yearly Show' by Belle Vue members that is regarded as being a primary factor in the establishment of B.A.F. in 1952. At the time, the Show was held at the City Hall in Manchester and lasted for seven days! The response from the public was so great for the event (at which the tanks were displayed on trestle tables rather than in tableaux), that it soon evolved into a permanent, and very important, fixture in the aquatic calendar.

B.V.M.A.S. members have continued to support B.A.F. every year since its inception and still provide Stewards, fish entries and a tableau, picking up several

distinguished awards along the way.

The Society has always been self-supporting, taking its name, Belle Vue, from the Zoo, in or around whose grounds meetings always took place. Then, as today, members did not confine their interests just to keeping fish. Many a meeting was livened up by the introduction of live reptiles brought in by Gerald Iles directly from the Zoo's collection.

At the outbreak of World War II, it was thought that membership would drop and so the subscription fee was lowered to prevent this. After the War, membership soared to such an extent that a Waiting List had to be brought into operation!

Present-day potential members are assured that there is no such list today. Meetings take place on the first Wednesday of every month at The Neighbourhood Centre, Stockport Road, Longsight, Manchester, starting at 8.00 p.m.

1986 will be B.V.M.A.S.'s Golden Anniversary. We wish the Society all the very best for the next 50 years.

**Subscription Rates:** Adults, £2.00; Juniors, £1.00.

**Apply to:** Mr. Alan Birchenough (Secretary), 15 Albany Avenue, Openshaw, Manchester, M11 1HQ. Tel. (061) 370 4164.



It's great when two parties can say that they can agree to differ and still remain the best of friends. Such openness is hard to find but, when you do find it, it reflects a deep commitment to one's ideas that goes hand in hand with a genuine respect for someone else's opinions and an implicit acceptance that not everyone is going to think like you do.

If you transfer this positive and constructive way of thinking to an aquatic Society, then you have an organisation of real worth. Tongham A.S. is just such a Society—personal experiences with members of the Tongham Committee over a number of years have repeatedly

shown this to be so.

Tongham Aquarist Society was formed in 1951 by a group of enthusiastic fishkeepers in the Aldershot area.

The aim of the Society was, and still is, to further the understanding of all areas of the aquatic hobby, whether the individual interest be in coldwater, tropical, marine or plants.

The Society has seen many changes over the years. At one time, membership dropped to such a low level that it seemed highly unlikely that T.A.S. would survive. However, through the hard work of some dedicated members (who, today, still form the backbone of the Society), T.A.S. has grown into one of the largest and most respected Societies in the southern area with membership in excess of 60 and a regular attendance of 30-40 members on club nights.

Meetings are held twice a month, on the first and third Thursdays, at The Victoria Hall, Ash Hill Road, Ash, Nr. Aldershot, Hampshire, starting at 8.15 p.m. and ending around 11.00 p.m.

The annual Open Shows have become eagerly anticipated events in the 'southern' aquatic calendar. Again, support is very

good with an average of 400 entries or so.

Other T.A.S. ventures include Inter-Club competitions and participation in other Societies' Open Shows where members have enjoyed considerable success, e.g. remaining undefeated in Inter-Club competitions in 1985.

Tongham Aquarists are also very active in local and national aquatics, supplying committee members both to the Three-Counties Group and to the Association of Aquarists.

In 1985 the Society was present at the Aquarian Fishkeeping Exhibition, Kempton Park (organised by the A. of A.) and at the British Aquarists' Festival (F.N.A.S.). On both occasions, the Society tableau gained a highly creditable second prize. At Kempton, the success was further enhanced by the award of the 'Su Pollard Trophy', presented by Su, herself, to her favourite tableau.

**Subscription Rates:** £1.00 plus a fortnightly sub of 45p for Adults and 30p for Juniors, O.A.P.'s and Disabled Members.

**Apply to:** Mrs. Anne Ottley (Secretary), 71 St. Michael's Road, Aldershot, Hants. Tel. (0252) 310862.

## Tongham Aquarist Society

# News from the societies

## Obituary

It is with regret that I have to announce the death of our Honorary Life President, George Cooke, who died peacefully at home on Friday, 8th November.

He was born in Birstall where he ran the family business of "G W Cooke and Son—Shoddy Manufacturers" and was a well respected businessman in the Batley area.

Most of us knew George through the fish keeping hobby; he was an ardent fish breeder.

He was the President of the Leeds Aquarists Society, a founder member of

the Dewsbury A.S., and a founder member of the F.N.A.S. with which he was associated for 25 years holding the positions: Judge's Secretary, B.A.F. Organiser, Chairman, Vice President, President, and on retirement from the Federation, Hon. Life President.

He leaves a wife, a son, two daughters and seven grandchildren. Our sympathies go to his wife and family upon their sad bereavement.

P.S. Moorhouse, F.N.A.S. Judge  
Piscene A.S.

Those of us on the staff of *The Aquarist & Pondkeeper* who knew George as a good friend and associate, wish to add our regrets and condolences to the above in mourning the passing of one of the hobby's great stalwarts. (Ed).



George and his wife, Dorothy, on the occasion of their Golden Wedding anniversary, August 15th, 1978

### Association of Midland Goldfish Keepers

The 1985 Annual General Meeting of the AMGK was held at Foleshill Community Centre, Coventry on Sunday 10th November. The following members were elected to serve on the Committee for 1986: Jim Amos, President; Norman Giles and Ivor Parry, Vice-Presidents; Dave Southworth, Chairman; Andrew Barton, Vice-Chairman; Pamela Ratcliffe, Secretary; Trevor Gray, Treasurer; Stephen Smith, Publicity Officer; Elaine Edmunds, Show Secretary; Malcolm Hallows, Lay Member.

Membership of AMGK is only £4.50 per annum and new members from throughout the country are always welcome. Meetings are held on Sunday afternoons at Foleshill Community Centre, Coventry six times throughout

the coldwater season. A newsletter/magazine is also published three times per year.

Membership applications to: Miss P. Ratcliffe, Secretary AMGK, "Kingyo," 112 Gorleston Road, Birmingham B14 4NP.

### Edinburgh Aquarists Society

The Society held their A.G.M. at St. Brides on Tuesday 8 of October 1985. Following a report on the very successful previous year's activities, a vote of thanks was registered for the outgoing committee.

The following office bearers were elected to serve for 1985/86.

President: John Wright. Vice President: Harry Shields. Hon. Secretary: Jake Milligan. Ass. Secretary: Liz Wright. Hon. Treasurer: Margaret Cook. Membership Secretary: Margaret Cook. Show

Manager: Jack Irish. Ass. Show Manager: Colin McLaughlin. P.R.O.: Bob Cook. Club Shop: Steven Kemp. Library: Kevin Fletcher. Travel Club: David Wales. Junior Rep: Nicki McMechan.

Prior to the meeting being closed, Mr. Jake Milligan was voted Honorary Membership of the society for his long service.

E.A.S. is a society of fishkeepers, tropical or coldwater dedicated to furthering the hobby. Meetings are held at St. Brides Community Centre, Orwell Terrace, on the second and fourth Tuesdays of each month commencing at 7.30 pm. Talks, slide shows and club table shows are held. For further information please contact Membership Secretary, Mrs. M. Cook, Telephone 031-4430258.

### Runcorn Aquarist Society

Secretary: Mrs. R. Muckle, 23 Adela Road, Runcorn, Cheshire, WA7 4TU. Tel: Runcorn (092 85) 76099.

Deputy Secretary: Mr. G. K. Janion, 2 Water Street, Runcorn, Cheshire, WA7 1DS. Tel: Runcorn (092 85) 61521.

### Aberdare Aquarists' Society

Fourth Open Show to be held at Aberaman Y.M.C.A. on Sunday 18 May, 1986. Details and Show Schedules from: Mr. R. Williams, Show Secretary, 298 Cardiff Road, Aberaman, Aberdare CF44 6UU. (Tel: Aberdare (0685) 876604).

### Paisley & District Aquarist Society

The above Society held its monthly meeting on Tuesday 5 November in Paisley Museum, High Street, Paisley. The guest speaker for the evening was Mr. Tommy Boyle from our neighbouring Clyde Aquarium Club and approx. 40 members and visitors were treated to an excellent talk on 'Labyrinth Fishes' liberally illustrated with colour slides from Mr. Boyle's personal collection.

The speaker was invited to judge the well supported table show for 'Barbs', 'Cichlids' and 'Angel Fish'.

A large contingent had a very successful coach trip to the British Aquarists Festival at Belle Vue, Manchester, on Saturday 2 November and joining us this year were some friends from two of our neighbouring Societies—Helenburgh & Garelochhead A.S. and Clyde Aquarium Club. According to reports everyone had a good time.

The Society meets on the first Tuesday of the month and further details can be obtained by contacting the secretary, Evelyn Lindsay, on 041-886 2881.