

JANUARY 1979 50p

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**Bob Featham:** Editorial Manager, responsible for content and planning of the publication.



**Clive Nicholls:** Chief photographer of several publications, he now adds P.F.



**Clive Nash:** A writer with the company, he has built up a number of tropical tanks.



**Nick Fletcher:** A writer with EMAP Nationals, he is a keen tropical fish enthusiast.



**Gerry Bellenger:** Advertisement manager who will operate from his London office.



**Dave Stirling:** EMAP Nationals' art editor, he is responsible for design.

THE December issue of Practical Fishkeeping, the first in EMAP hands, was given an extremely favourable welcome by both advertisers and readers.

Certainly, our decision to make it a practical publication aimed at all participants has won the support of many people.

We aim to continue in that vein and there are many articles in this January issue, dealing with all aspects of the hobby, which will answer a multitude of queries.

Some of you may have experienced difficulty in obtaining a copy of Practical Fishkeeping. Don't let it happen again. Fill in the order form which appears on page 22 and give it to your newsagent. That will absolutely guarantee you a copy.

One of our main aims is to improve the news coverage in the

magazine — and build up a closer relationship with our readers. We urge all clubs and associations to let us have full results of competitions as soon as they take place — and keep us up-to-date on coming events and items of news. Get it in quickly so that material isn't outdated when it appears in Practical Fishkeeping.

And please make use of our other service — the letters page and the queries' column, where our experts are anxious to solve as many problems as possible.

Practical Fishkeeping is here to help YOU, the aquarist.

*Bob Featham.*

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**Make sure of your regular copy — page 22.**

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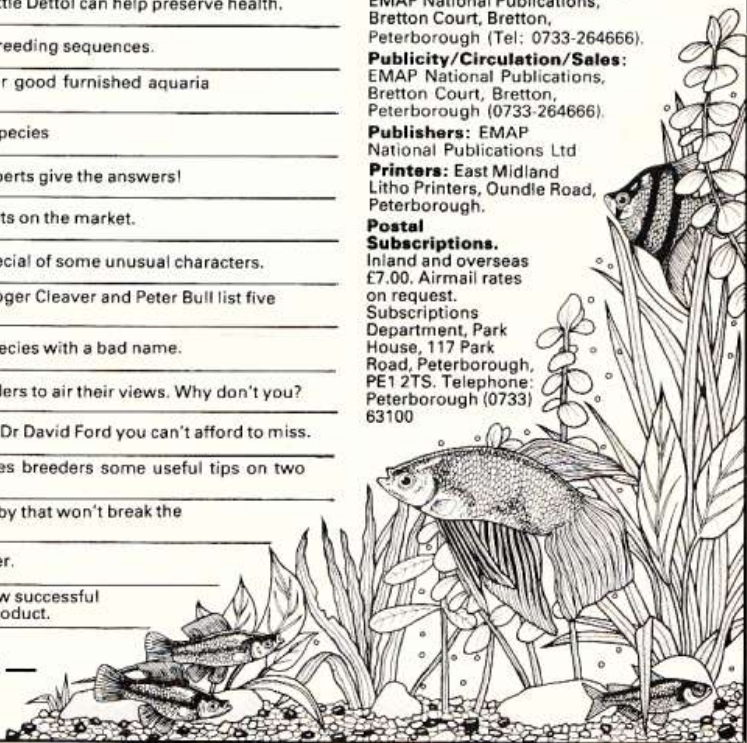
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# AQUARIAN

ALL THE FISH THAT HAVE WON MAJOR AWARDS



**Best Fish in Show, Scottish Aquarists Festival.** Federation of Scottish Aquarist Societies. *Synodontis nigriventris* (Upside Down Catfish) entered by Mr. J. Nimmo of Bellshill, Lanarkshire.

**Three Rivers Championship, Tyne-Tees Area Association.** *Ctena poma Kingsleyae* (Climbing Perch) entered by Mr. P. Wright of Washington, Tyne & Wear.



**Fish of Fishes, Yorkshire Aquarists' Festival.** Yorkshire Association of Aquarist Societies. *Sternopygidae spp.* (Knife Fish) entered by Mr. & Mrs. D. Caldow of Scarby, South Humberside.

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**Best Fish in the AQUARIAN SHOW.** Northern Goldfish and Pondkeepers Society. *Carassius auratus* (Lionhead Goldfish) entered by Mr. F. W. Orme of Birmingham



**Champion of Champions 1978.** British Aquarists' Festival. Federation of Northern Aquarium Societies. *Mylossoma argenteum* (Silver Dollar) entered by Mr. J. Alder of Hartlepool, Cleveland.

**Supreme Champion 1978.** Federation of British Aquatic Societies. *Corydoras rabouti* (Dwarf Catfish) entered by Mr. T. Cruickshank of Greenford, Middlesex.



For more information on Aquarian and free advice on all fish-keeping questions, please write to: Dr. D. M. Ford, Animal Studies Centre, Freeby Lane, Waltham-on-the-Wolds, Melton Mowbray, Leics. LE14 4RT.

distributed by Thomas's, Pellon Lane, Halifax.



# Boisterous Barbs

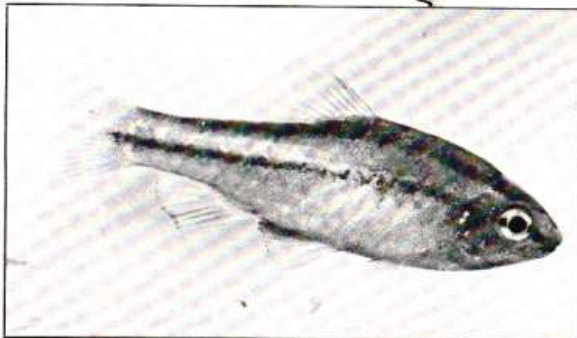
Meet eight top varieties of a species which adds colour and excitement to your community tank.

FAST swimming, relatively peaceful, easy to breed and inexpensive — no wonder that the barbs are some of the most popular community tank fish. A shoal of tiger barbs flashing through the water, with the light reflecting off their shimmering football jersey stripes, sets off a well-planted tank to perfection.

And the boisterous nature of these little fishes is in marked contrast to the behaviour of the sedate bottom-hugging scavengers or the aloofness of the angel fish. Barbs, in both appetite and character, are extroverts.

The barbs are part of the great family of Cyprinidae, which includes many British freshwater species like the carp, tench and minnow. They are distributed over most of the globe, but most of the commonly-kept varieties are from Asia rather than Africa. In their natural habitat they prefer fairly fast-flowing water with plant cover, and if you examine the shape and colour of a typical barb you can see why — the fish are strong-finned, reasonably streamlined, with a mouth set neither for surface feeding nor bottom scavenging. They are designed for midwater swimming, and the dappled colouration is typical of fish that dart through well-planted, sun dappled water.

Literally hundreds of different barb species have been kept by aquarists, but less than a dozen are frequently seen in the shops. So here is a checklist of a deservedly popular family of fish.



**CHERRY BARB (*Puntius titteya*), Ceylon:** This little fish reaches only two inches in length, but is a deserved favourite. Both sexes have pronounced barbules at the corner of the mouth, from which the barb family gets its name. At breeding time, the male turns a shade of deep cherry red and has a passion to match his extravagant colour.



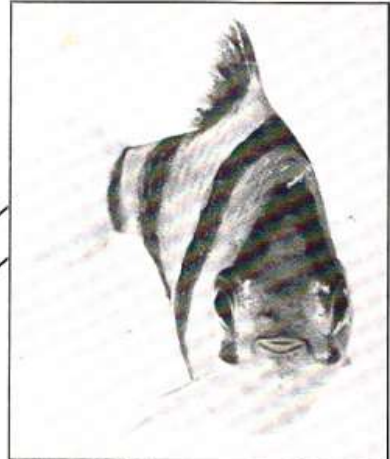
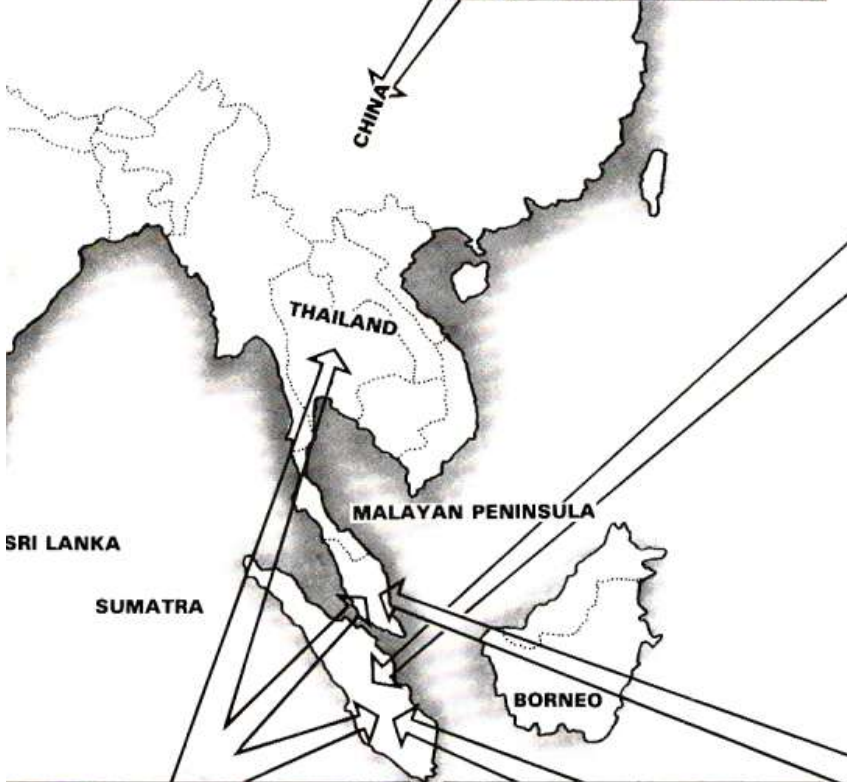
**ROSY BARB (*Puntius conchonius*), India:** Another extremely popular barb which grows quite large, up to six inches, and lives for three or more years. The non-breeding colour is subtle, a metallic greeny-silver, but at spawning time the male develops a bright crimson flush all over the body. His dorsal fin is edged with black, and both sexes have a small, circular black spot on the wrist of the tail. Several strains of long-finned rosy barb have been developed. This fish is one of the great gluttons of the tank, and so is useful for the beginner, mopping up excess food which might otherwise foul the water.



**BLACK RUBY BARB (*Puntius nigrofasciatus*), Ceylon:** The Latin name means 'black striped' and the fish has also been called the 'poor man's tiger barb'. The patterns of the stripes are quite similar, and out of the breeding season, ruby barbs are less colourful than their tiger cousins. But at spawning time change comes over the male. The ground colour of the body flushes purple, and the head takes on a scarlet hue. Females are less colourful, and the fins are paler than the male's. This is an average sized barb, up to 2 inches long, and one of the longest lived.



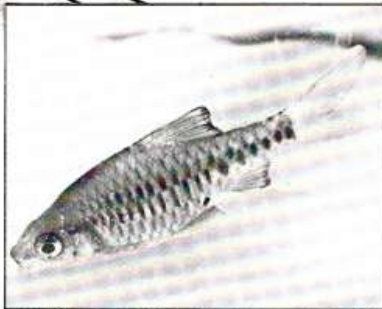
**SCHUBERTI BARB** (*Puntius schuberti*), **China**: This barb, also known as the golden barb, is almost certainly a colour variety of *Puntius semifasciolatus*. It is not found in the wild. Overall colour is bright yellow, with orange fins, and the males have dark markings on the sides. These fish grow very rapidly, and can reach four inches. They have insatiable appetites and eat everything that comes their way — one of the few tropical fish that can develop a genuine weight problem.



**TIGER BARB** (*Puntius tetrazona*), **Sumatra**: Some aquarists fight shy of this fish, because they have heard it nips fins. The more tigers that are kept together, the less likely this is to happen. Tiger barbs grow to about 2½ inches and live up to three years. The body colour is yellowish, with four black bars, one of which goes through the eye. Males are slimmer than females, with redder fins. There is an albino form now available, with a pink body marked with red. Both varieties are very tolerant of conditions, providing the water is clean and well oxygenated. If all is not well, they hang head-downwards in a trance-like state.



**TINFOIL BARB** (*Puntius schwanenfeldi*), **Malaysia, Thailand, Sumatra**: Of all the barbs, this requires the most space, since adult fish can grow to a foot long in very little time. For this reason, they should have a tank to themselves. They are deeper bodied than most barbs, with large, iridescent silver scales, orange fins edged with black and pronounced barbules. They are far more vegetarian than other barbs, and will quickly chew away any plants, so they should be kept in unplanted tanks and fed plenty of lettuce and the like. Despite their obvious drawbacks, these fish are quite popular. Buy youngsters, since they will mature quickly and are far cheaper than adult fish.



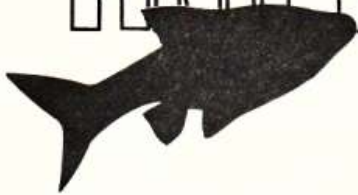
**CHECKER BARB** (*Puntius oligolepis*), **Sumatra**: This is one of the smaller barbs, never exceeding two inches, and is less extrovert than most, preferring plant cover where possible. The name 'checker barb' comes from the alternate black and silver markings which, especially in the male, produce a chessboard effect. Sexing these fish is easy, since only the male has the orange fins edged with black.



**SPANNER BARB** (*Puntius lateristriga*), **Malay peninsula**: This fish, also known as the 'T barb', grows to six inches. The young fish, in particular, have the distinctive pair of dark, vertical bars on the front part of the body and a horizontal bar running from the tail into the hindmost bar. The effect is more of a wrench than a spanner, and the markings become less definite as the fish grow older. There is no sure way to tell male and female apart, except of course that ripe females are deeper-bodied. It requires more space than most barbs.

# FIND THE FISH

## Practical fishkeeping COMPETITION



Enter our new fun competition for all the family. It's easy, it's free to enter, and it could win you this super prize. The photograph on this page shows a furnished tank with the following plants, Cryptocoryne, Java Moss and Spatterdock. The tank also contains one Red-tailed Black Shark (Labeo bicolor). Use your skill and judgement to decide from all the information contained in the picture where you think the eye of the fish is likely to be. Indicate that spot by marking a cross in ink or ball-point pen on the picture. You have a maximum of 25 crosses. The entrant who places a cross nearest to the eye of the fish will be adjudged the winner.

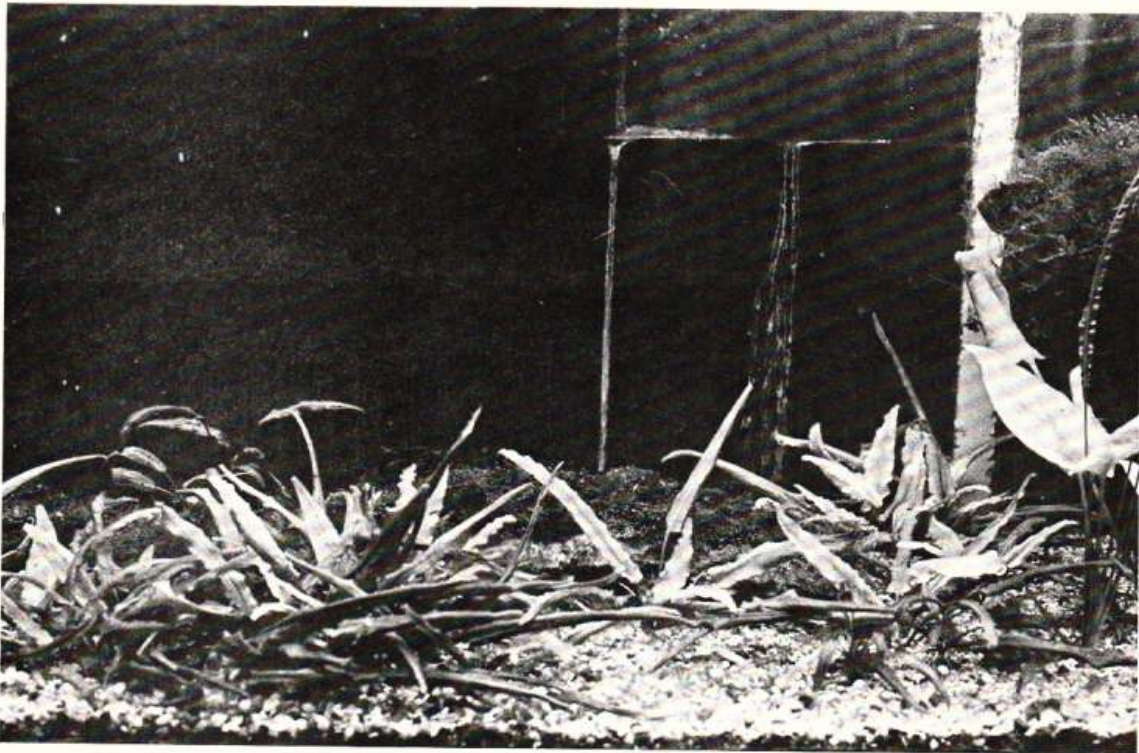
## WIN A CUSTOM BUILT FULLY STOCKED TROPICAL AQUARIUM.

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**RULES.** The judges' decision will be final and no correspondence may be entered into. Entry is free and the winner will be notified by post. ENTRIES CLOSE FEBRUARY 1st.

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Send to: PRACTICAL FISHKEEPING MONTHLY  
FIND THE FISH (COMPETITION NO. 2)  
117 PARK ROAD, PETERBOROUGH PE1 2TS.

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# Patient doing fine!

Koi with a headache gets VIP treatment



MATLOCK Waterlife Centre certainly got more than they bargained for when their latest import, a consignment of cold-water fish arrived from Japan recently.

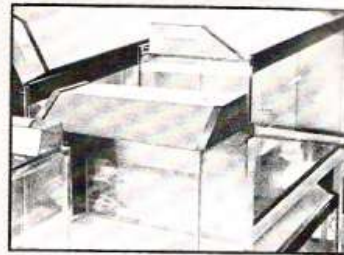
For one of the specimen fish, a 10 lb Koi Carp, destined for the centre's new display pool was found to have a nasty gash on its head.

But a local vet was called and, during a half-hour operation, the wound was stitched. Centre owner Mr John Tarbutt commented: "It was a very special and rare operation

which has rarely been done before. If the fish had been left the result would have been a nasty scar and a serious drop in the fish's value."

The carp, valued at £250, felt nothing during the operation — for it was drugged to avoid any risk of pain.

Aquarium manager Mr Stephen Kay is seen holding the fish. The injury was believed to have been caused in transit, although it was one of six Koi Carp which were individually boxed for the journey.



Build your own tank — an exciting picture sequence guide to the art of doing it yourself



Feeding Marines — with David Ford

Meet a man back from Africa — and with a real story to tell



Plants: David Shields continues his intriguing series

# Next month

# Livebearers

How to give the young a fighting chance

by Nick Fletcher

To keep tropical fish in a healthy state is only part of the hobby. To breed them is a altogether more satisfying experience.

Fortunately, the family of live-bearing toothed carps, which includes the guppy, platy, molly swordtail and mosquito fish, is prolific. The problem lies, not so much in persuading the fish to mate and give birth — but rather in giving the young a chance to develop. For half-inch fry are an irresistible titbit to their own parents, and to almost every other fish that is kept in a community tank.

First a word about how livebearers reproduce. Unlike the egglayers, the male and female fish are easily told apart. The male's anal fin is modified into a 'gonopodium' — a stick-like organ which acts as a duct for the sperm. At mating time, the male 'drives' the female around the tank with fins held erect manoeuvring around her until he can insert the tip of the gonopodium into her vent. The sperms travel up the female's oviduct to the ovary, where the eggs are fertilised.

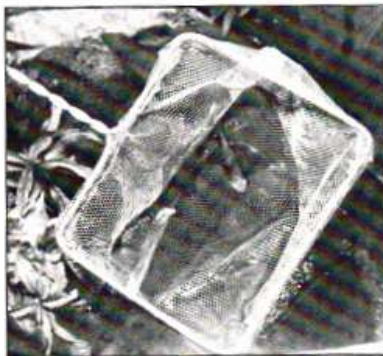
These eggs now develop inside the female and depending on the temperature in the tank it is a month to six weeks before the young fish — complete miniature replicas of their parents — are born. They are larger than the fry of egglayers, and so can be started on fine powdered dried food without the need for infusoria.

In a community tank, with a population of several livebearers, there is no control of which fish will mate with which. What's more unless you intervene, you will be unlikely to find more than the odd young fish appearing. These will be individuals which have managed to hide up in weed cover until they have reached a size where they are too large to be preyed upon.

Yet it is quite easy to step in and ensure that all the young survive. The example we will use is the platy (*Xiphophorus maculatus*).

There are two schools of thought on breeding these fish. Devotees of the breeding trap method will argue that it cuts out the need for additional tanks; those opposed to it will claim that the young fish produced are inferior. I propose to look at both methods, bearing in mind that livebearers are the first fish an aquarist will try to breed, and that funds may be limited.

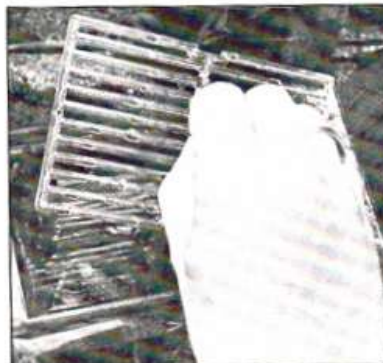
The purpose of the breeding trap is to isolate a pregnant female fish, both from other fish in the tank, and from her own young. The trap, which is made of clear plastic and floats within the main tank, has a slatted bottom through which the young fish drop at birth. How do you recognise a pregnant female? That's simple — for a start, the belly becomes quite distended, and the 'gravid spot', the dark



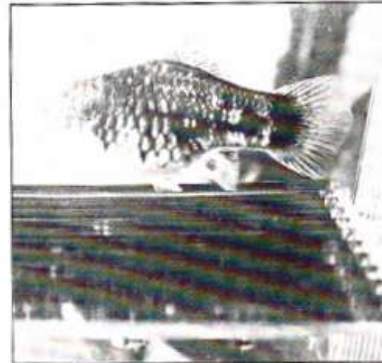
1. The pregnant female is netted from the main tank and placed in the breeding trap.



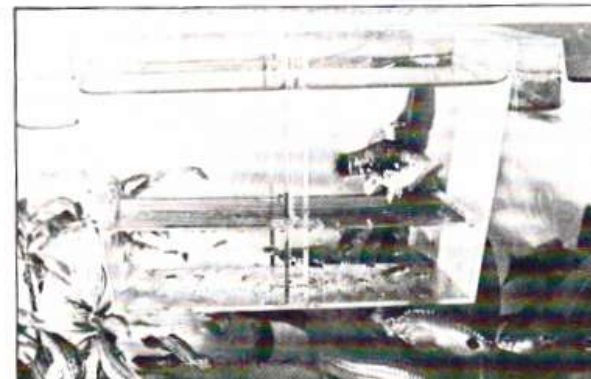
2. Care should be taken not to keep the female out of water any longer than is necessary during the transfer from net to trap.



3. This is the detachable, slatted bottom to the trap which prevents the young from being devoured by the mother fish.



4. The pregnant female has given birth to the first of the young.



5. The brood is now complete.



6. The female has been removed from the trap.

marking on the underside of the abdomen, becomes even darker.

At your first few attempts, you may find you are isolating the female well before she is due, but after a little experience, you should be nearer the mark. The fish is netted *gently* from the main tank, for any rough treatment can cause her to drop the young before she should.

Just before she gives birth, a subtle change comes over the female. She becomes disinterested in food, and every so often her anal fin will twitch backwards. This is in anticipation of when the young fish are ejected. If you can station yourself quietly nearby, it will be only a matter of minutes before you will see the young begin to emerge.

Their entry into the world is tail-first, and they sink to the bottom of the trap for a few moments before swimming to the surface to fill their swim bladders. There is no danger that the parent fish will eat them while she is still giving birth.

Numbers of young vary enormously. One female can give birth to up to five broods from one mating, and the first brood is liable to be the smallest. Twenty five young is a good average for a platy, but up to 100 is possible.

As soon as the birth is complete, the female fish can be removed from the breeding trap. If this trap is large enough, it is possible to rear the young within it, feeding them initially on newly-hatched brine shrimp and micro-worms, later on larger live and dried food.

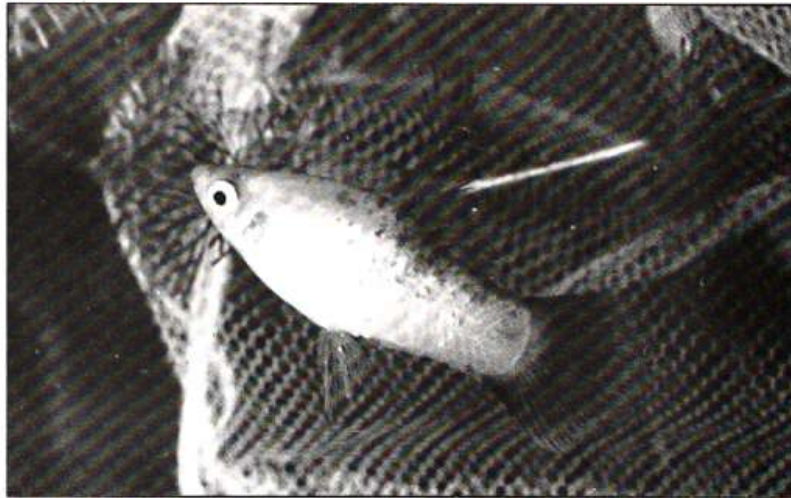
The second method of breeding platies has the advantage that you can be selective in choosing the parents, essential if you wish to produce a desirable trait in colouration or finnage.

Your female should be 'virgin' — having had no contact with male fish, either at the dealer's, or in your own tank. Place her, with the male of your choice, into a smaller (18 x 10 say) tank which is well planted with dense vegetation which will give any young a place to hide. Suitable varieties are cabomba, hornwort or ludwigia.

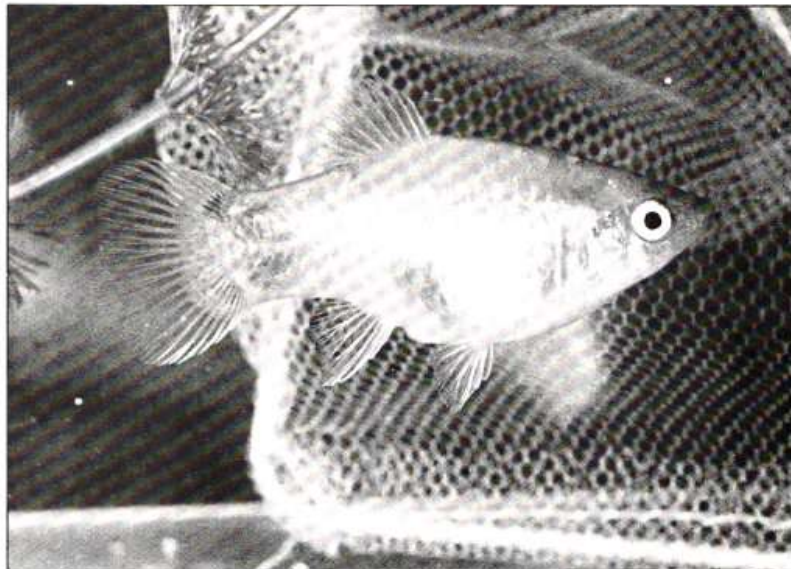
Usually mating will take place within hours, when the male can be removed. But provided he does not drive the female too hard, he can be left in the tank for a week or two.

After this, it is simply a matter of waiting for the birth. You are more likely to notice that the female has become suddenly slim, rather than see the youngsters, for they will take refuge in the plant cover. As soon as you are sure she has 'produced' you can remove the parent fish from the breeding tank, which then becomes a rearing-on tank for the young.

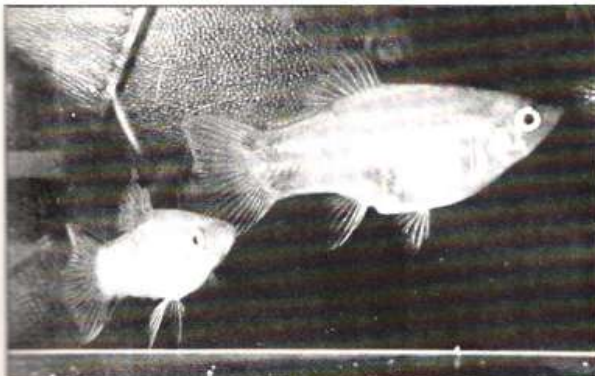
Bear in mind that if you want to keep the strain pure, the adult female must be kept away from unwanted male attentions.



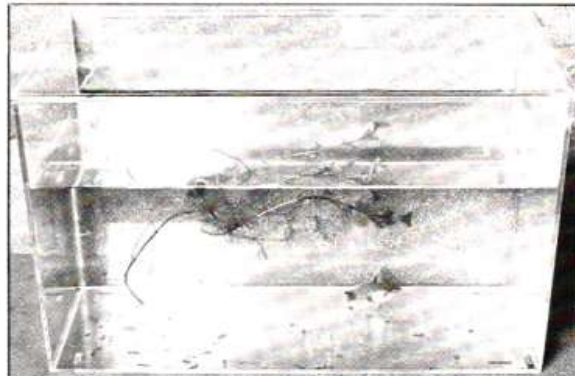
1. The male platy can be distinguished by the stick-like conopodium which here is being carried close to the body.



2. The female, in this case a 'Micky Mouse' (note the markings on the wrist of the tail).



3. The male, with his fins spread, displays to the female prior to mating.



4. After mating has occurred, the male fish is removed, and the gravid female is left in the tank until she gives birth.



## Second biggest -and still growing

PROOF that more and more people are starting to keep cold-water fish can be seen in the number of enquiries received by the Northern Goldfish and Pondkeepers' Society.

"Our membership already covers a wide area, including Bradford, Halifax, Leeds, Liverpool, Southport, Preston, Bolton and Manchester," said society press officer **Pauline Hodgkinson**.

"The society, formed in 1959, is the second largest goldfish association in Britain."

Anyone wanting more information can contact secretary **David Lord** at 40 Hospital Road, Bromley Cross, Bolton, Lancs.

Members receive a free quarterly journal, and are, of course, welcome at the regular meetings on the second Sunday of every month in Manchester. Meetings start at 2pm at the Baptist Church Hall, Beaver Road, Didsbury, Manchester 20.

Member **Leslie Baxter** was the guest speaker at the latest meeting, and his topic was goldfish genetics.

The society's 1979 show is to be held in August at Bolton's Silver Street Sports Centre.

### Programmes available

IF anyone missed the third National Open Koi Show at Knutsford, Cheshire, in September, the British Koi-keepers' Society have a number of copies of the souvenir show programme available. Just send 30p to **Malcolm Waumsley**, at 165 Woodside Road, Amersham, Bucks.

The programme includes articles on pond construction, filtration and, of course, the fish themselves.

### Fund raising is so vital

FUND raising is the only way for a club to combat rising costs. That was the message from chairman **N. Short** at the Mid Sussex Aquarists Society meeting.

"Members have already done a great deal in this direction," he said. "But we will have to put in even more effort." The speaker was local water authority official

**R. Muggeridge**, who talked about the role of the biologist in the water industry.

The society meetings are held at the Fox and Hounds public house at Haywards Heath, Sussex. Further details of the club are available from secretary **Bill Slade**, at 'Sundown', Bolney Road, Anstey, Haywards Heath (telephone Haywards Heath 53747).

### The 'Boss' takes over

NEW chairman of the East London Aquarists and Pondkeepers' Association has the very apt name of **J. Boss**! Other officers elected at their annual meeting include: president **P. Campion**, vice presidents: **Messrs A. Field, R. Dodkin, Petto and Taylor**; vice chairman, **K. Wrightson**; secretary, **Mrs P. Harris**; treasurer, **A. Harris**; programme secretary, **J. London**; show secretary, **T. Waller**; show organiser, **K. Palmer**; newsletter editor, **R. Campion**; equipment officer, **K. Baker**; press officer, **D. Flack**; social secretary, **Mrs R. Boss**; librarian, **G. Lyne**; other committee members, **Mrs D. Lyne** and **S. Bray**.

The association's annual show in 1979 will be on October 13.

### Smile please!

LONDON section chairman **Ralph Johnson** has been appointed official photographer for the British Koi-keepers' Society — and some of his work was shown at the autumn meeting in London.

Ralph showed two of his cine films — complete with soundtrack — dealing with the London section's visit to the Koi East Anglia branch, London's open show, and the National Open Koi Show at Tatton Park.

A lecture and discussion group on koi was led by society chairman **Roland Seal**, who had travelled down from his Stockport home for the meeting.

Other visitors who travelled long distances for the meeting were **Lorette and Peter Reynolds**, from Sutton Coldfield; **Hilda Allen**, from Peterborough; and **Koi East Anglia** representatives **Harry Brundish** and **Kelly Groom**.

### Give them room to grow

USEFUL hints on garden ponds was the topic of **Lew Emery's** talk to Bristol AS members at their meeting. **Lew** reminded enthusiasts that fish need room to grow — so don't overstock the pond.

Answering a question on pool construction, he said that **Snowcem** could act as a sealant if applied before drying out. "But after the construction of any pond, test it out for a while with inexpensive fish before committing valuable stock," he said.

### Kingsclere the club to join

IF anyone in the Basingstoke, Hants, area wants to join a good club, try the Kingsclere DAS.

Meetings are at 8pm on alternate Tuesdays at the Council Offices, Kingsclere. Further information can be obtained from the secretary, **Mrs M. R. Birtwhistle**, at 16 Normanton Road, Basingstoke, Hants.

Other officers elected at the society's annual meeting include: chairman, **P. Birtwhistle**; show secretary, **A. Step**; treasurer, **M. Cook**; club shop organiser, **M. Shore**.

### Junior problem

COVENTRY Pool and Aquarists Society are having a little difficulty finding a suitable venue for their meetings. "With a growing junior section, pubs are not a suitable as they once were," said secretary **Alan Brown**.

"A community centre, school or church hall would suit us down to the ground, as long as room hire is cheap, it isn't too far from the city centre, and the owner aren't too fussy about the possibility of a little spilled water now and then."

If anyone has any ideas, contact **Alan** at 189 Baginton Road Styvechale, Coventry (telephone Coventry 413252).

### Cough-up!

THE Goldfish Society of Great Britain want to remind members that 1979 subscriptions are now due. The cost is just £3.50 for family membership, £3 for individual membership, and £1 for juniors under 18.

Send the cheques and post orders to treasurer **J. E. Parker**, 61 Bursers Way, Hutton, Brentwood, Essex.

### World-wide

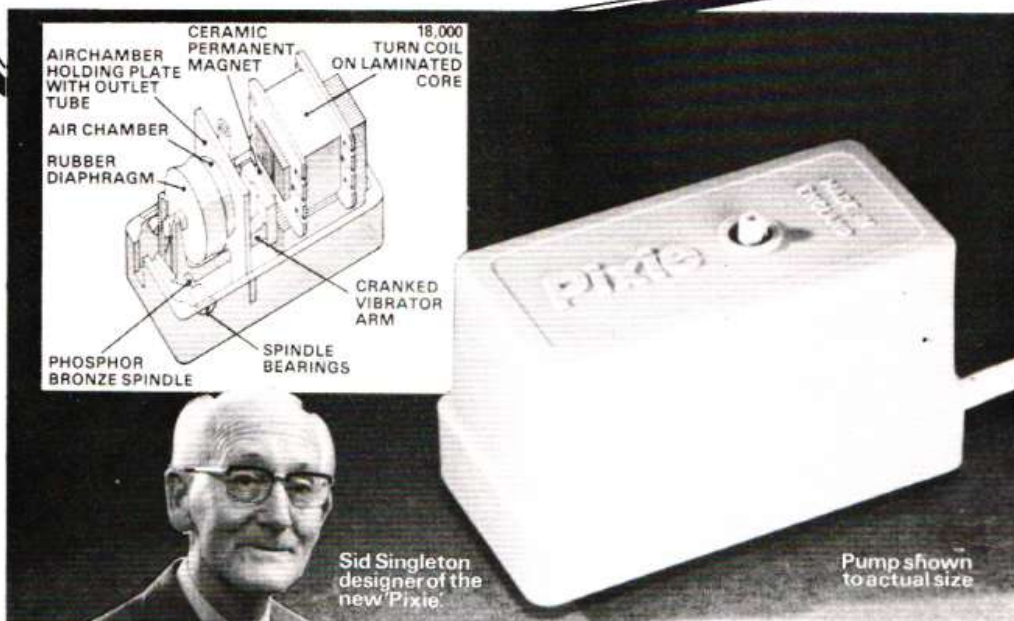
MANY aquarists may not realise it, but the Goldfish Society Great Britain attracts members from all over the world. On recently, new subscriptions have been received from as far away as Holland, and even New Zealand and California.



**GORDON SMITH**, who won eight top awards at this year's Irish Aquarists Festival, receives his trophy for the best fish in show from the Mayor of Drogheda, **Ally**

**Farrell**. The Festival is run jointly by Drogheda Tropical Fish Society and Dublin Society of Aquarists.

A masterpiece of  
micro engineering—designed and  
manufactured in Britain.



Sid Singleton  
designer of the  
new 'Pixie'

Pump shown  
to actual size

## 'Pixie' The new aquarium pump— quiet—powerful—economical.

The first vibrating-magnet aquarium pump made in Britain. It is designed by Sid Singleton, the creator of the Presetmatic, the Controlomatic and other quality aquarium heaters.

The "Pixie" is based on an entirely new concept. The vibrating arm is far more compact than in normal air pumps. In fact, it is the smallest vibrating-magnet aquarium pump in the world!

The internal design of the pump is so precise and simple that, by removing the four cover locking screws, all the working parts will slide out. They can

then be re-assembled in less than one minute - it's as simple as "Lego". There are no internal nuts or screws to set or adjust to get the correct air pressure. All working parts are made of tough, lasting materials. At the heart of the pump is the magnet coil which contains 18,000 turns of copper wire, two thousandths of an inch in diameter.

Every pump will automatically deliver the same amount of air - sufficient for the aeration requirements of two 3ft. aquaria.

### Specifications:

Size	3 1/8" long x 1 1/8" wide x 1 1/2" high
Weight	Only 6 ozs. (170g)
Power	The "Pixie" builds up a back pressure of 2 PSI which means that it will operate air stones effectively up to a depth of 48". It will pump one litre of air per minute at a depth of 18".
Quiet	The new design concept ensures that the "Pixie" is exceptionally quiet - "as quiet as a cat's purr"!!
Economical	The normal retail price (inc. VAT) is £3.79. It's the compact design that allows such a low price on a precision engineered pump. Running costs are unbelievably low. The "Pixie" uses half a unit of electricity per week when running non-stop. At current electricity prices that is 1 1/2p per week!

The 'Pixie' from  
  
**Armitages**

Armitage Bros. Limited, Colwick, Nottingham.  
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AQ7

## The ALGARDE Guide to Better Fishkeeping



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**THE REGAL TANG** (*Paracanthurus theutis*) has been described as "the bluest thing on earth". So, as you can imagine, it is a beautiful fish for the marine enthusiast.

Most specimens are caught on the Philippine reefs, where it reaches an adult length of about four inches. A schooling fish, it is one of the marines that can be kept happily with its own kind.

The Tang, also known as the Flagtail Surgeonfish, usually appears to go into a state of mild shock after being introduced to the aquarium. Many new owners have been worried sick as the fish lies flat on the bottom under a stone or piece of coral — but be patient, and don't interfere with the fish, and it will soon brighten up.

The adult fish is a brilliant blue with two black stripes, black edges to the fins, and a bright yellow tail.

**THE COMMON CLOWNFISH** (*Amphiprion percula*), or **Orange Anemone Fish**, is another great beginners fish — well coloured, hardy and easily available.

This Philippine species is very common in domestic aquaria and is another fish happy in company of its own kind. They like a high temperature, between 78 and 80 degrees Fahrenheit, and will thrive on almost any food available. But don't let their contentedness lead to abuse.

This species gets on very well with anemones, and are often seen nesting among tentacles that would sting and possibly kill other invaders.

The clownfish's basic colour is white, with brilliant orange markings on the body and head.

The Damselfish family has several hardy and very colourful community tank possibilities, but it is important to remember that these fish can be very aggressive to members of their own species. So the rule with any type of Damsel is one only per tank.

**THE ELECTRIC BLUE DAMSEL** (*Pomacentrus caeruleus*) is probably the best known and a fish many beginners favour. A dedicated digger, the Electric Blue can quickly redesign a coral tank layout that has taken an aquarist many hours to set up!

Despite his at times annoying habits, this little fish provides hours of amusement and will eat practically anything.

Its colouration is a brilliant electric blue, with yellow fins.

Another popular member of this family is the **DOMINO DAMSEL** (*Dascyllus trimaculatus*). Sometimes called the Three Spot Damsel, young or newly imported specimens are a deep sooty black with little or no trace of iridescence.

# Marines

Clive Nash looks at six beautiful species ideal for your tank



As it matures in captivity, the intensity of the blackness may decline to a dark metallic grey colour. It takes its name from white spots just above the head and on the top of the back.

It is strongly territorial and has several ways of showing anger. It sometimes moves rapidly up and down, like a yo-yo, and has also been heard to make a deep, throaty grunting noise. All that adds up to a colourful and very entertaining tank inmate.

One type that has been labelled a "problem" fish — unjustifiably according to several experts — is the **YELLOW LONGNOSE BUTTERFLY** (*Forcipiger longirostris*).

The long, swordfish-like jaws of this variety have probably helped the false impression that it is hard to keep.

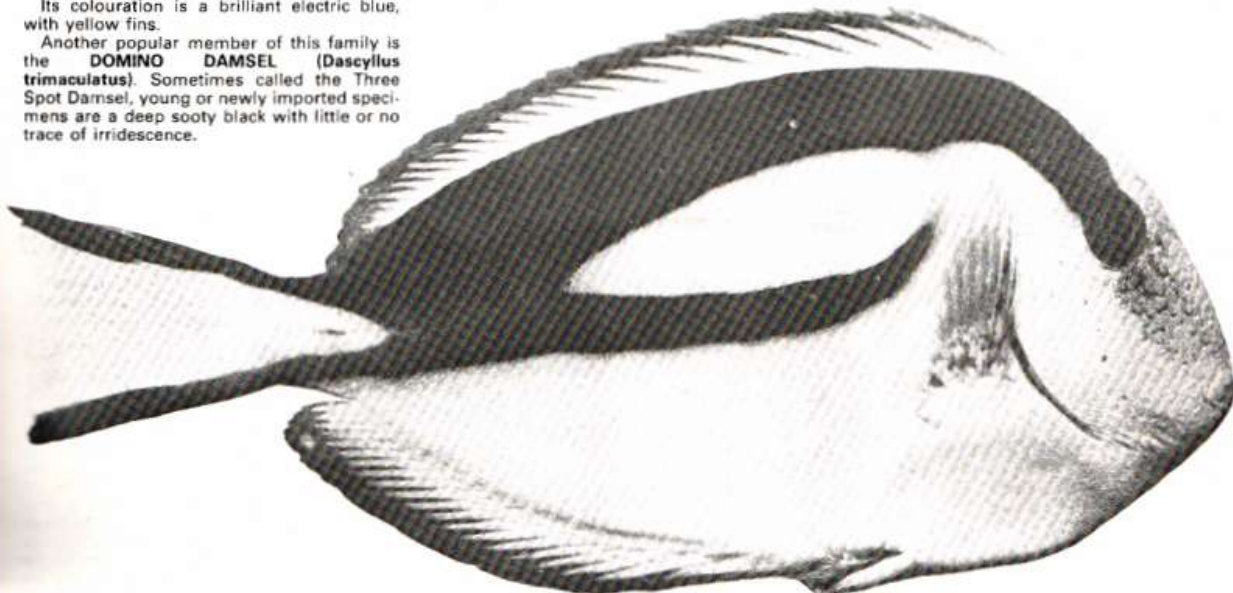
This is an adaption to make it easier for the fish to remove small molluscs and crustaceans from inside heads of coral — making it appear a finicky feeder. But this isn't true. The fish is tough and adaptable, soon settling down to a mixed diet in the marine aquarium.

The butterfly part of the name is taken from the general body shape — like a butterfly at rest with its wings folded — and from its movements.

The slightly spasmodic movements of the fish searching for food among the coral is very similar to a butterfly fluttering. The fish is bright yellow, with a steel-blue head and jaws.

An easy member of the Angelfish family is the **CORAL BEAUTY** (*Centropyge bispinosus*), a striking little fish that extends from East Africa to the Philippines.

Growing to only two inches or so, it is a fairly peaceful and secretive fish. Because of this "shyness", make sure your tank has a few caves or rocky hiding places.



**THE REGAL TANG** — described as the most beautiful thing on earth.

# AQUATIC QUERIES

Continued from previous page

# All about Marines

with Graham Cox

## This clown should be dead!

MY community of marine fishes includes a red-brown grouper; two five-inch triggerfishes (*odonus niger*); two scats at 2½ inches each (*Scatophagus argus*); one three-inch *Amphiprion sebae*; and one 2½ inch *Tetraodon fluviatilis*. My sebae clown seems to be getting beaten up by some of the other fish — what can I do to stop this? — A. Moss, Cheltenham, Glos.

In view of the presence of the large grouper, the triggerfishes and the pufferfish I'm not too surprised that the clownfish is having a rough time — I'm frankly amazed that it is still alive! You should either sell the clownfish or start another tank for him. In another part of your letter you asked if it would be all right to add a *Pterois volitans* (dragonfish). The clownfish, as mentioned above, would be in additional danger, as would

possibly the scat. Otherwise, the community of fishes would seem nicely balanced.

THE only aquarium that I have at my disposal is a 24 x 12 x 15, and while I realise that this will make my tank all the more difficult I thought that by limiting the number of fish and exercising some diligence, I could have some success. I wish to keep one *A. percula* but I am ignorant as to which (and how many) anemones it would be possible to maintain with the percula. And should I introduce fish or anemones first? — T. Norman, Blackpool, Lancs.

All clownfishes seem to prefer *Stoicactis* and *Raianthus* species of anemone, and in that order of preference — although you always find the odd exception to the rule. Regarding the number of anemones, you could have as few as one and as many as half a dozen (depending on size) since it is almost impossible to overstock an aquarium with sessile

invertebrates. This is because invertebrates constitute such a minute biological loading factor when compared with fishes.

As for your stocking sequence — first ensure the biological maturation of the filter bed, using the appropriate nitrite test kit. Then buy all the living rock you need. Thirdly, buy all your invertebrates, including your anemones, then wait for seven to 14 days for the system to stabilise. Finally, add the clownfishes.

## Grouper losing dark colour

IN my 48 x 20 x 20 marine tank, I have an 8in. grouper which seems to have some infestation, since it keeps rubbing itself on the coral. It is also losing its dark colour. I am trying 'Marine Cure' — will this help? — W. Buchanan, Edinburgh.

If I am correct in reading between the lines, I assume that when you spotted your grouper 'flashing',

i.e. scratching and scraping against corals, which is the classic symptom of external parasitisation by flukes, you went and bought some 'Myxazin'. This would provide no lasting relief, as 'Sterazin' would have done. Then, convinced Myxazin was useless, you went out and bought some other product, which may or may not be the treatment you need.

I would now recommend that you effect three 33 per cent water changes at 2-3 day intervals. This is not only because there may be undesirable reactions between the various chemical cures you have used, but because it will give you the opportunity to stir up the coral sand, releasing all the greyish-fawn coloured sea humus, which the flukes are feeding on.

Having got rid of the sea humus, you can begin an entire water treatment with Sterazin which will quickly rid the tank of the trematode, nematode and cestode parasites which are at the root of the trouble.

## Gordon steals the show

IRISH Aquarists' Festival manager Gordon Smith firmly established himself as Eire's top fish-keeper by scooping a record number of wins at this year's show. In fact, Gordon took away eight of the top 17 awards, together with high placings in several other sections.

His list of wins included best fish in show, best egg-layer, best livebearer, best competitor, best miniature aquarium, best cichlid, best AOS egg-layer and best AOS livebearer.

And he was highly placed in the sections for barbs, bettas, labyrinth fish and egg-laying tooth carps.

"That has to be a record for the event," said show secretary Ken Norton. "Gordon really ran away with the whole event."

The fish that earned Gordon the Best Fish in Show award was a discus.

The other highlight of the festival was the use of Federation of British Aquarium Societies' rules and judges — the first time overseas judges had been used in the show's 40 year history. They were Pete Cottle, Ken Saxby, Colin Wood and Terry Noronha.

The festival also attracted entries from the North Lancs section of the Fancy Guppy Association, who took first and second places in the female guppy class.

Some people had feared the switch to BFAS rules might not go down too well, but Ken Norton

was well pleased with the response.

"Everyone accepted the new rules without hesitation," said Ken. "Though we did have to borrow 105 glass tanks from the Irish Tropical Fish Society because all entries had to be presented in containers with a flat front — so out went the sweet jars that were such a common sight previously."

### MAJOR AWARDS

**Best fish in show,** Gordon Smith; **best fish in show, runner-up,** Emanuel Flanagan; **best furnished aquarium,** Christopher Smith; **best egg-layer,** Gordon Smith; **best livebearer,** Gordon Smith; **best competitor,** Gordon Smith; **best coldwater fish,** Des Tate; **best breeders' team,** Noel Scully; **best miniature aquarium,** Gordon Smith; **best barb,** Reg Hoare; **best characin,** Reg Hoare; **best cichlid,** Gordon Smith; **best labyrinth,** Sean O'Toole; **best catfish,** Willie Bride; **best plant,** Jimmy Lyttle; **best AOS egg-layer,** Gordon Smith; **best AOS livebearer,** Gordon Smith; **North Kent Aquarists' Shield for best angel fish,** John Fitzsimons.

### FULL RESULTS

**Furnished aquaria:** 1 Gordon Smith, 2 E. Flanagan, 3 Seamus Carter, 4 Gerard Forrest; **freshwater tropical:** 1 Gordon Smith, 2 Paddy Corrigan, 3 Sean O'Toole, 4 Alan Sallis; **miniature and marine:** 1 Christopher Smith, 2 Seamus Carter; **barbs (BA):** 1 and 2 Martin Lyttle; **barbs (BZ):** 1 Reg Hoare, 2 Jimmy Lyttle, 3 Gordon Smith, 4 Karl Martin; **hemigrammus, hypheosobrycon, cheridon, paracheiron:** 1 Alan Bride, 2 David Hughes, 3 Reg Hoare, 4 Desie Bryans; **characin, any other variety:** 1 Reg Hoare, 2 David Jamison, 3 Desie Bryans, 4 Tony Sherlock; **angel fish (DA):** 1 Gordon Smith, 2 John Fitzsimons, 3 Uel Pollock, 4 John Fitzsimons; **apistogramma, pelmats, nanna cara:** 1 Willie Bride, 2 Desie Bryans, 3 Paddy Corrigan, 4 Willie Bride; **cichlids (DZ):** 1 E. Flanagan, 2 Tony Sherlock, 3 Michael Meegan, 4 Brian Easton; **bettas (highers):** 1 Ken Norton, 2 Gordon Smith, 3 Ken Norton, 4 Michael Heeneey.

**Labyrinth:** 1 Sean O'Toole, 2 Jimmy Lyttle, 3 Gordon Smith, 4 Gerard Forrest; **egg-laying toothcarps:** 1 Tony Sherlock, 2 Gordon Smith, 3 Tony Sherlock, 4 Peter Smith; **tropical catfish:** 1 Willie Bride, 2 Alan Bride, 3 Jackie Macreedy, 4 Moe Mahony; **corydoras, brochis:** 1 Sean

O'Toole, 2 Karl Martin, 3 David Hughes, 4 D. McLaughlin; **rashora:** 1 E. Flanagan, 2 Alan Bride, 3 Jimmy Lyttle, 4 Jim Donohoe; **penck fish:** 1 Noel Scully, 2 Karl Martin, 3 Noel Scully, 4 Jackie Macreedy; **cichlids (DC):** 1 R. Callaghan, 2 Gerard Forrest, 3 and 4 R. Callaghan; **WC, MM:** 1 Roy Thompson, 2 Robert Bogue, 3 Roy Thompson, 4 Paddy Corrigan; **loach:** 1, 2 and 4 Des Tate, 3 Willie Bride; **tropical egg-layers:** 1 Gordon Smith, 2 Reg Hoare, 3 and 4 Karl Martin; **pair of fish:** 1 Reg Hoare, 2 Noel Scully, 3 John Floody, 4 Noel Scully; **male and female guppy (G):** 1 Alan Sallis, 2 Reg Hoare, 3 Peggie Norton, 4 Noel Byrne; **male and female guppy (P):** 1 and 2 Fancy Guppies Assn., 3 Noel Scully, 4 E. McGoldrick; **wordtail:** 1 Brian Easton, 2 Desie Bryans, 3 Uel Pollock, 4 Mick O'Brien; **platy:** 1 Stephen Tully, 2 E. Flanagan, 3 David Jamison, 4 Ken Norton; **molly:** 1 E. McGoldrick, 2 Paddy Corrigan, 3 E. McGoldrick, 4 Reg Hoare; **single and twin tail goldfish (U):** 1-4 Des Tate; **single and twin tail goldfish (V):** 1 and 2 Christopher Smith, 3 and 4 E. McGoldrick; **coldwater:** 1-3 Des Tate, 4 Christopher Smith; **breeders, egg-layers and livebearers (XBM):** 1 Noel Scully, 2 Brian Easton, 3 and 4 Des Tate; **breeders, egg-layers and livebearers (XOT):** 1 Gordon Smith, 2 Jimmy Lyttle, 3 Peter Smith, 4 Paddy Corrigan; **aquatic plants (ZA):** 1 Sean Cooke, 2 Desie Bryans, 3 Sean Cooke, 4 Karl Martin; **aquatic plants (ZB):** 1 Jimmy Lyttle, 2 tropical livebearers: 1 Gordon Smith.

## Angry koi keepers will boycott Belle Vue

THE British Koi-Keepers' Society, absent from this year's British Aquarist Festival at Belle Vue are unlikely to take part again.

In a joint letter to Practical Fish-keeping, Barry Rowlinson and Peter Waddington, secretary and treasurer respectively of the society's northern section blamed "boring officialdom, tailor-made rules and politics" for the society's withdrawal.

They claim that the society pulled out of this year's festival after organiser Cliff Walker said their usual 20 by 10 foot pool would

have to be replaced by a stand showing glass tanks.

Wrote Barry and Peter: "We were granted a non-competitive stand at the 1972 show for the following reasons:

● Our fish are bred to be viewed from above, as in a pond, not in a tank.

● Koi are large fish and it would be misleading to have a display of small koi in tanks simply because our 24-inch koi would not fit in a glass tank. We have to show the public that koi are large fish.

● It would be virtually impossible to find judges who could actually judge koi against other coldwater classes.

But we will no longer be allowed space at the show because of a new rule stating traders and competitive stands only."

Show organiser Cliff Walker dismissed the society's allegations as "rubbish".

He said: "For a start, the new rule quoted makes no reference to traders. It simply states that all society stands must be competitive."

"The simple truth is that the Koi-Keepers' Society refuse to accept any other society's judging methods."

"To look at a fish from above only is not enough for most federation rules. Fish could have fin rot or any other disorder that couldn't be seen."

"The society are welcome to apply for space at Belle Vue anytime," he went on. "All they have to do is enter a competitive stand and accept the accredited judging

PRACTICAL FISHKEEPING



OVER the past 3 or 4 years I have examined well over 100 air pumps of all sizes and prices. Many of these — generally the better ones — have been featured in detailed reviews in *PFM*, where a comprehensive and independent assessment of all aspects of their performance has hopefully led to intending purchasers making the 'right' selection of pump for their own particular requirements. With so many apparently good air pumps on the market today, the obvious question must be posed — is there room for still further models to be introduced? The makers of the Regula 200 think that the answer is clearly in the affirmative.

The Regula 200 has been introduced to the UK quite soon after its debut in its native West Germany. The design is not totally new, having appeared in a similar but far more complex guise as the 'Perma' some 10 years ago. The mechanics of the pump really could not be simpler — it has just one moving part. The heavy coil sits at the bottom of the pump and provides a 'push-pull' action to the magnet, rather than the 'wiping' pattern we are familiar with on most air pumps. Above this sits the large circular magnet, which is connected directly to the diaphragm. This in turn is fixed to the valve block which is at the very top of the pump, connecting directly to the central air outlet nozzle. The simplicity of the design as described here might, in some people's eyes imply poor performance or inferior construction. Nothing could be further from the truth — in fact I think that the apparent success of the Regula 200 is due to keeping the operation of the pump as simple and free of gimmicks as possible, whilst using components of high quality. This latter point is a vital one, since the strain on the diaphragm is substantial. However, the development in recent years of superior rubber compounds for such highly-stressed components means that its failure should be as infrequent as on the more traditional styles of pump: certainly the manufacturer's own programme of testing and development did not encounter any problems on that score.

But first, a more detailed description of the pump. It is drum-shaped, approximately 4in high overall, and with a maximum diameter of 2½in. The base is a milk-chocolate colour, whilst the main part of the body is of a distinctive dark orange matt-finish plastic. The base contains a combined air-filter and volume control (which, uniquely, controls the output by regulating the amount of air entering the pump body), and has three rubber feet which are really effective in preventing transmission of noise to the surface on which it is sitting. Normally air pumps with just three feet are quite unstable, the drum-shaped pumps being notoriously so, but in this case I

could not criticise the arrangement at all. The body connects to the base with four crosshead screws, and these are the target for one minor complaint — it really was hard work to tighten and remove them repeatedly as I had to do with my testing; however, that is something not likely to be a problem for most owners.

The magnet is a very powerful one, and more than 1in in diameter. It is attached directly to what must be the most substantial diaphragm of its size on any pump — this really is solidly made and looks likely to give a long period of service before replacement is necessary. The valve block too is solidly made, with unusual circular valves covering large airways to maximize the flow of air. The valve block is screwed directly to the top of the pump body, sealing against a rubber washer which channels the air to the central air outlet nozzle.

#### Performance

The following outputs were measured at various water depths, using an open-ended 6 foot length of standard airline.

Water depth Output	
(in)	(litres/min)
0	4.9
6	4.8
12	4.0
18	3.2
24	2.7
30	2.1

These figures suggest that the pump could supply at least six or eight small internal filters or airstones, or provide power for at least two airlifts of the sort used in marine aquaria. However, what really makes this pump stand out from the field is its almost total lack of noise, even at its full output (reducing the output by means of the control provided made virtually no difference). That puts it into direct competition with perhaps just two or three other pumps of similar output that are widely recognised as being especially quiet: noise assessment at these low levels tends to be rather subjective, but I would argue that the Regula 200 could be judged the winner on that count at least. Which is not surprising, since the one moving part is effectively sound-insulated from the rest of the pump by means of that heavy rubber diaphragm.

One tends to be rather wary of newly-developed items of equipment before they have had the opportunity to prove themselves in terms of performance and reliability over a lengthy period, especially where there are so many good models already available.

The Regula 200 is manufactured in West Germany by Orthobil Apparatebau, and distributed in the UK by the Jaynor Organisation. The price is £10.95, inc. VAT.

# What's new

## Germans launch air pump with a difference

Technical writer Cliff Harrison looks at some new items of equipment which have come onto the market in recent months



The Regula 200 — an air pump recently introduced to this country.



A view of the underneath of the pump. The circular disc between the rubber feet is the output adjuster. Its removal allows the air filter medium to be replaced.



Underview of the valve block, clearly showing the circular valves (right) and the unusual full-flow airways (left).



The large circular magnet is fixed directly to the top of the moulded diaphragm, avoiding the 'pivot' arrangement found on most pumps.

## Taking up the routine chores

The Rena Automatic Fish-Feeder and Lighting Control might seem, at first sight, to be something of a luxury in fish-keeping equipment. Certainly it does nothing that could not be done just as well by a human hand, but therein lies its real value. It takes over some of the routine chores that we might otherwise forget, or at times be unable to fulfill.

On a year-round basis, the lighting timer will turn your lights on and off at regular, pre-selected times. This way your plants will be getting a regular duration of illumination automatically, and any variation from the ideal can be recognised and adjusted accordingly. At holiday times the feeder is also brought into use to ensure the fish are receiving some nourishment on a regular basis.

The Rena Feeding/Lighting Control Unit costs £24.75 complete; up to a further four feeders (for additional aquaria) can be connected to the timer, and cost £7.43 each.



Concorde without wings or a submarine with portholes? In fact it's a member of the spiny eel family, some of which can grow to three feet in length.

Unfortunately the habits of spiny eels can cause havoc in a tank of smaller fish. Tails will get lumps hacked out by that small, but effective set of jaws, and its knack of digging around under plants is not a great help to a well planted tank.

# Strange Encounters of a fishy kind

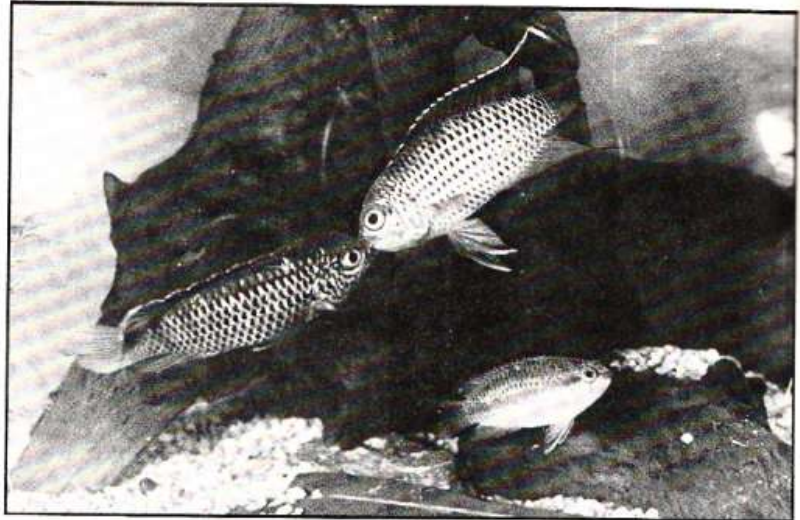
Allan Haines takes an amusing look  
at some funny situations



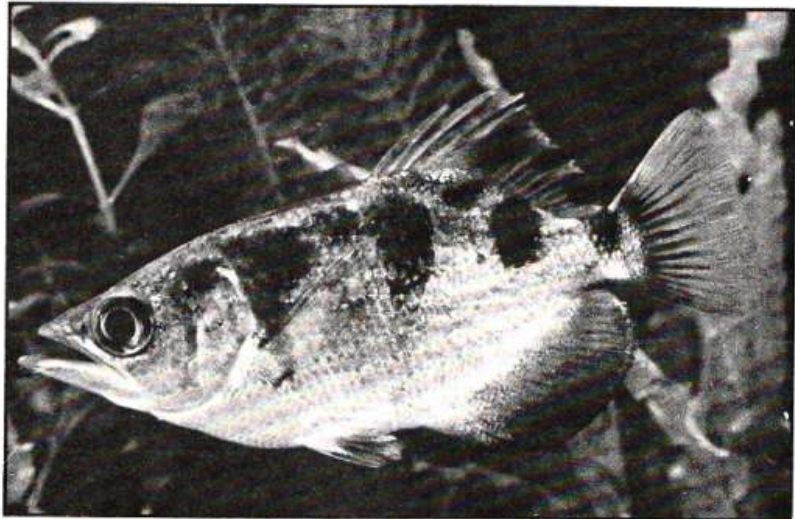
"With a forehead like yours I would have thought you had enough brains to build a proper door in this house. And what's the good of a home with a big hole in the roof anyway?" Such words would be in order from this lionhead or humphead cichlid, *streatocranus casuarius*, an unusual cichlid from Africa. But the old pot will perhaps one day make an ideal spawning site for the happy couple. That is if the lady stays long enough get used to her cramped looking accommodation.

Kissin' cousins perhaps, but there could be something a little bit wrong with this pair . . . both are male *nannacara anomala* or golden eyed dwarf cichlids. The poor unfortunate female looks on with disgust as her metallic green husband prefers to play with his pal in a test of strength.

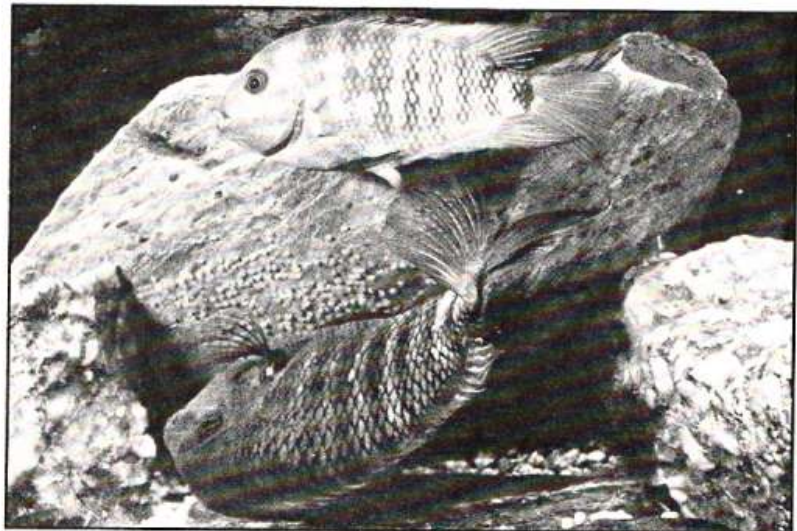
*Anomala* are native of British Guiana and because they grow to only 2 1/4 inches make ideal inmates for a small tank. But don't trust them with smaller fish.

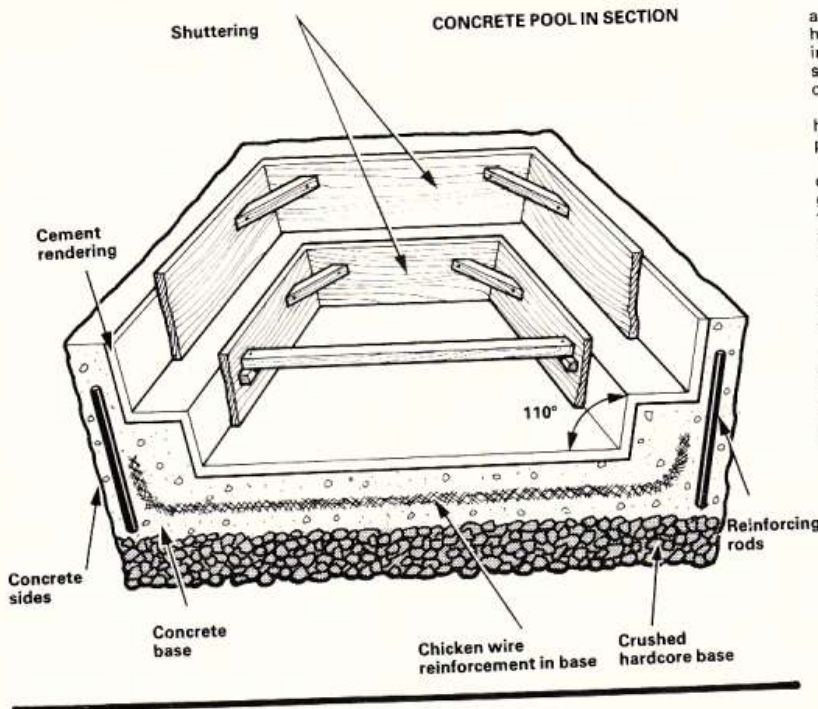


The Robin Hood of the aquatic world . . . that's this Archer fish. It can shoot down small flies and other airborne creatures by spitting a jet of water with the accuracy of an arrow fired by its famous namesake.



The world has been turned upside down since he became a father," could be the thoughts of this attentive *Cichlasoma Spillurum*. But like most of the *Cichlasoma* species the topsy turvy male is sharing his parental duties by blowing a batch of eggs adhering to the rock. Water fanned over the eggs will help keep them free from fungus and ensure a healthy young brood within a few days.





around six inches is about right — and the hole should be dug with these extra inches included. Allow also for the depth of a base of six inches plus a further four inches of hardcore below that.

After digging the hole to size a layer of hardcore is added and well rammed down prior to pouring of the concrete.

Pouring the base must be done with great care and a mix of three parts coarse aggregate, two parts sand and one part cement is the mix we would recommend. Work it up with water until a slightly stiff but workable mixture is achieved.

Some form of reinforcement should also be added to the base and for this we find chicken mesh wire ideal. But check it is well below the surface of the concrete.

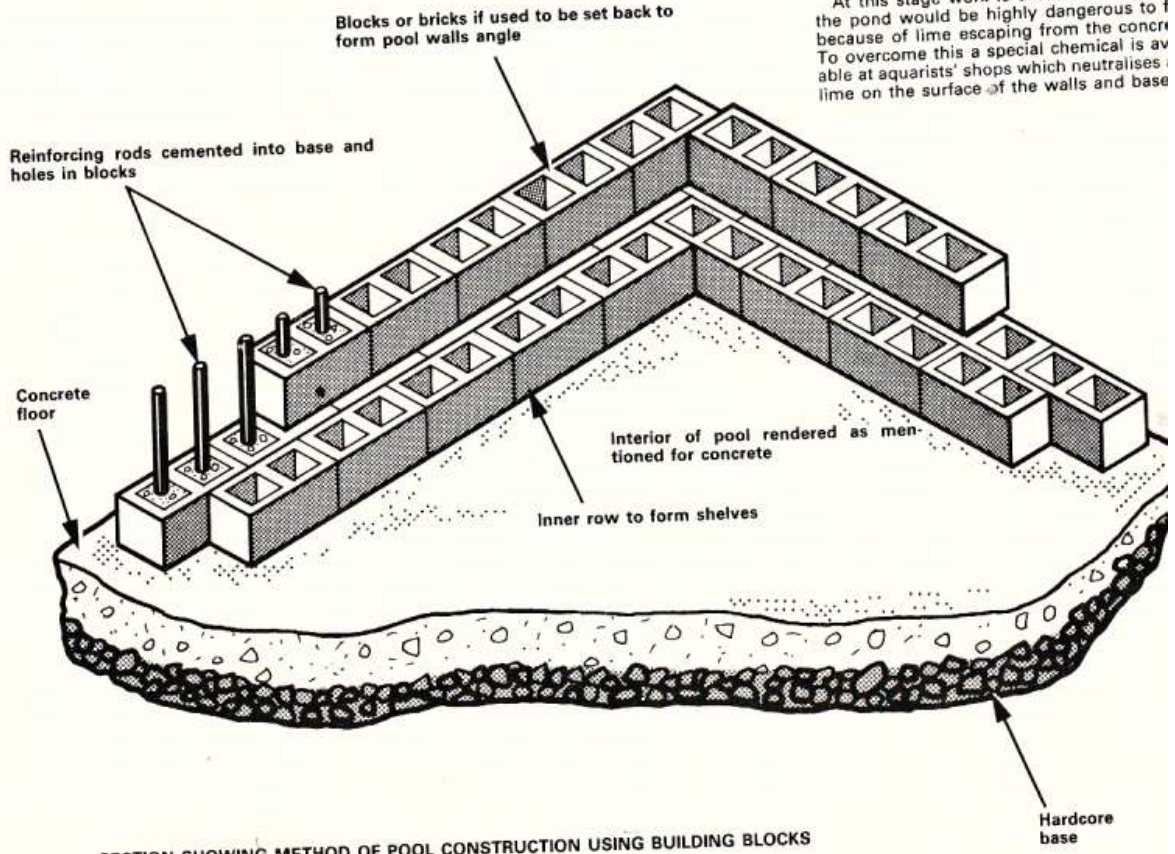
Shuttering for the walls can also be erected. And if the pool is large more strength added by inserting steel bars down the sides. Timber with hardboard or plywood is suitable but must be capable of supporting the weight of concrete while pouring and also allow air to be removed by ramming down.

Try to construct the shuttering so that each wall has a slight angle which will help relieve pressure from ice during winter. Mix for the walls is exactly as for the base and should be completed before the base has dried or otherwise the join will be weak.

Once the walls have dried sufficiently enough to allow shuttering to be removed final rendering can be applied with a mix three parts sharp sand to one part cement.

Cover each wall and the base with this mix trying to trowel it to a smooth finish. Waterproofing agent can be added to this mix if desired.

At this stage work is almost complete. If the pond would be highly dangerous to fish because of lime escaping from the concrete. To overcome this a special chemical is available at aquarists' shops which neutralises lime on the surface of the walls and base.



SECTION SHOWING METHOD OF POOL CONSTRUCTION USING BUILDING BLOCKS

## PVC OR RUBBER LINERS

SHAPES and sizes are almost unlimited with this material and again installation is very simple.

Just dig a hole, taking care to level the surrounding area first. A garden hose can be laid out to form the outline required and ledges can be positioned at will during the digging operation.

A point worth watching at this stage and one that applies to all pool construction when working on lawns. It's best to remove all turf around the working area so that a suitable edging can be built. Set the edge just below the normal grass level so that mowing can go right to the pool edge.

Once again remove sharp objects and stones before adding a layer of sifted soil or sand completely all over the hole. If you damp it slightly it sticks even to the sloping sides. Wet newspaper also works well and stays in position throughout the operation.

Now stretch the liner over the hole, ensuring it overlaps evenly all round. Add weights such as stones or bricks evenly all round the outside of the liner but far enough back to ensure they don't topple into the hole when filling starts.

Water is now allowed to run on to the liner from a hose and as the weight increases it will pull the liner slowly and evenly into the hole, partly by stretching and partly by pulling it downwards. Wrinkles will tend to vanish but even if they don't they are not noticed once the full water level is reached.

In the case of a right angled corner a single fold can be made and then folded back on itself.

Once full trim off surplus material, leaving a fringe of about six to eight inches which is tucked under whatever edging you choose. Such a pool is likely to last for many years and a life expectancy of at least 10 years can be nothing unusual.

## PVC VACUUM FORMED

THIS is a material now available which provides a cheaper version of the pre-formed pool similar to the fibreglass type. Although much cheaper than fibreglass, they are usually limited to the smaller sizes and the selection of shapes far fewer than in fibreglass.

Installation should be described for fibreglass but because the material is softer and more pliable even greater care is needed to prevent distortion. Fill with water only as fast as the soil is backfilled otherwise water pressure will force out the sides and possibly even cause splitting.

## CONCRETE AND BRICK

AGAIN similar in construction to the all concrete pool with a hole and base constructed as before. But shuttering is replaced by brick or hollow building blocks used for walls.

Nine inches is about the right thickness for a wall if using brick but if hollow blocks are chosen then added strength from steel bars will again be needed. Finish off with a rendering as described for a concrete pool.

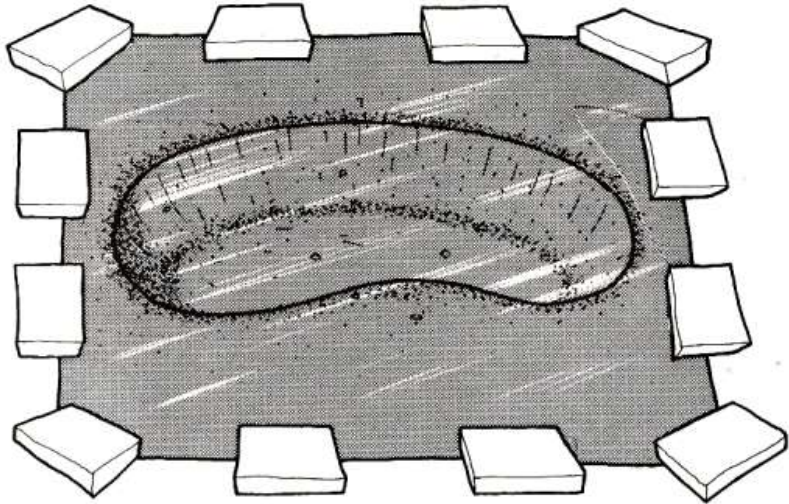
Perhaps the biggest problem after building a pool is what to do with the soil left over. This is where an informal pool can score since the unwanted earth can form the basis of a rockery to further enhance the surrounding area.

As you will have gathered from the descriptions pool construction needs time and a lot of care. But if undertaken properly the end result will be one from which many hours of pleasure will be enjoyed.

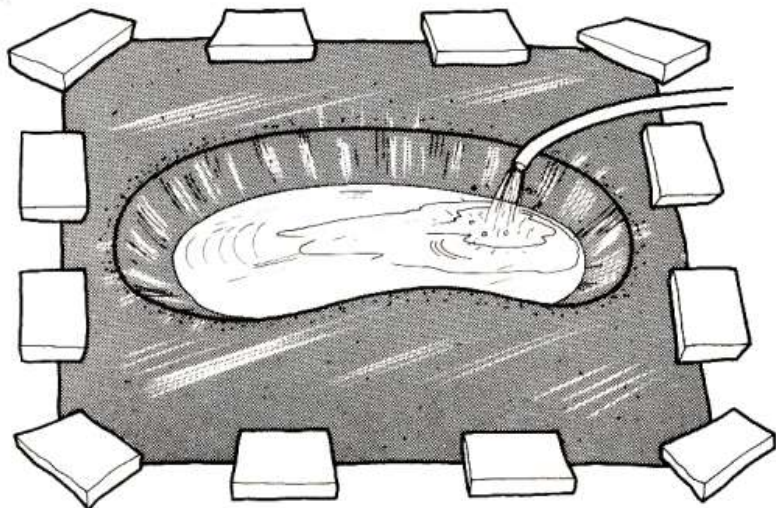
PRACTICAL FISHKEEPING

## POOL LINER INSTALLATION

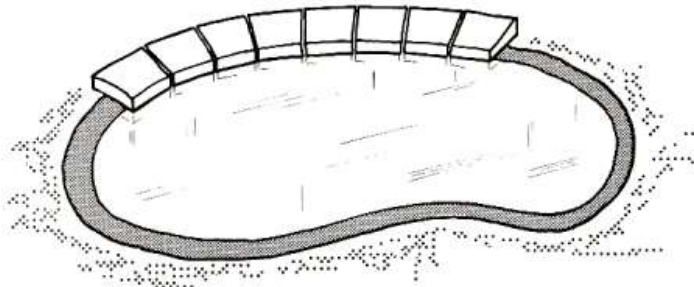
1 Liner stretched across excavation held in place by bricks or pieces of paving slab.



2 Water from the hose takes the liner down into the excavation under stress so eliminating bad creasing.



3 Surplus material is trimmed leaving approx 6 inches and the surround is then fixed in place after which stocking can begin.



continued —

For the cichlid family is a large one, and as in all large families, there are black sheep. Let's first consider the dark side of the cichlid character, taking as examples the convict, the Jack Dempsey, the Texas cichlid and the Mozambique — all larger representatives of their kind.

At their worst, these fish are sullen, territorial bullies who throw their bulk around the tank and harrass smaller fish to death. They are the first to rise to food, and if their appetite is satisfied before that food runs out, they are not content to let the other fish get their fair share. Instead they guard the spoils, fins aquiver, and make head-shaking straffes at anything wanting to join the feast.

At breeding time, no plants are safe. Male and female uproot all in their way, as they dig down in the gravel to prepare a site for the eggs. Courtship is rough, and the jaw-locking trials of strength sometimes end in the death of the weaker partner. And once the eggs are laid and hatch, even the hand that feeds will be menaced.

Even the worst delinquents have saving graces, and cichlids are no exception. Like the brawling bar hardcase who thinks the world of kids, cichlid parents show fanatical devotion to the fry. Some, the mouthbrooders, even allow the young to swim safely into their cavernous jaws when danger threatens.

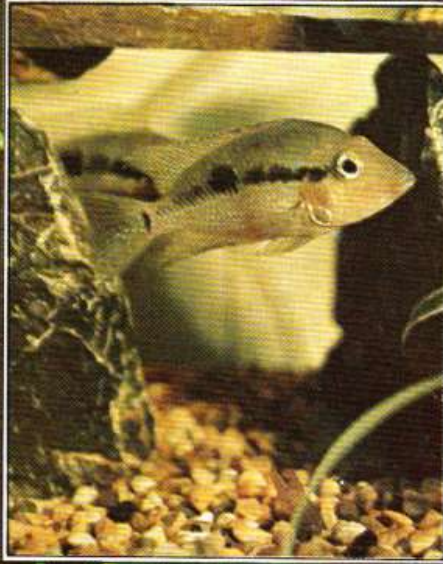
Now the other side of the coin. For every cichlid that roars round the tank like a demented punk rocker, there is one that prefers to let life pass quietly by from a safe vantage point under a rock. Such fish are the discus, the angel, the blue acara and the festive cichlid. Instead of seeking trouble, they remain aloof, even timid. Feeding habits are gentle, refined. They live and let live.

Then there are the dwarf cichlids — tiny versions of their larger brethren which make ideal community tank fish. In this category can be put rams, kribensis and the various Nannacaras.

One pygmy doesn't know when he's beaten. He's the jewel cichlid. At five inches, he's the terror of the tank, and proves conclusively that bullying isn't the sole right of the 'big fellas'.

● Pictures taken at Glen Davies Tropicals, Cowbit, Spalding and Sunset Aquarists Stanground, Peterborough.

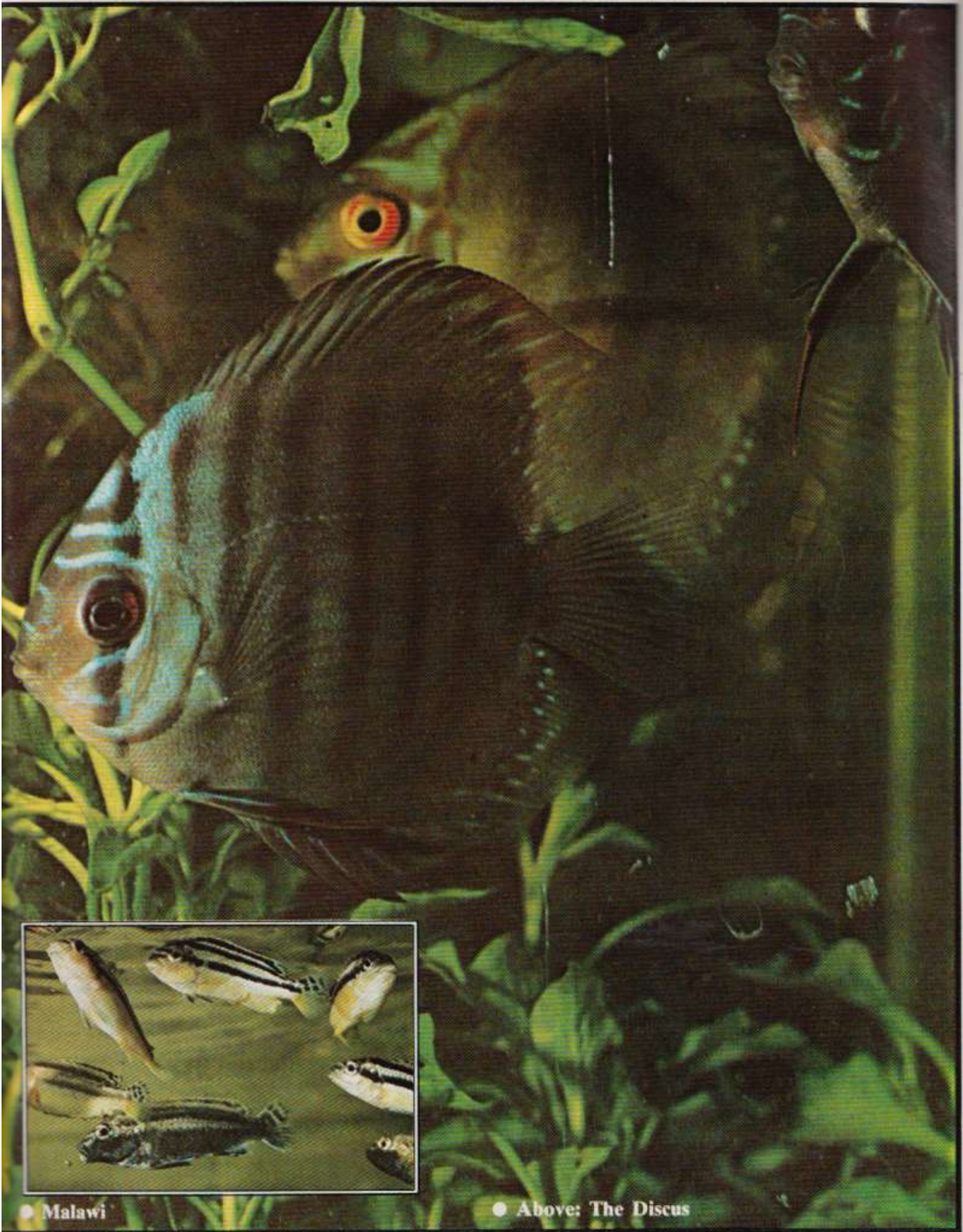
# CICHLIDS



● The Firemouth



● Blue Acara

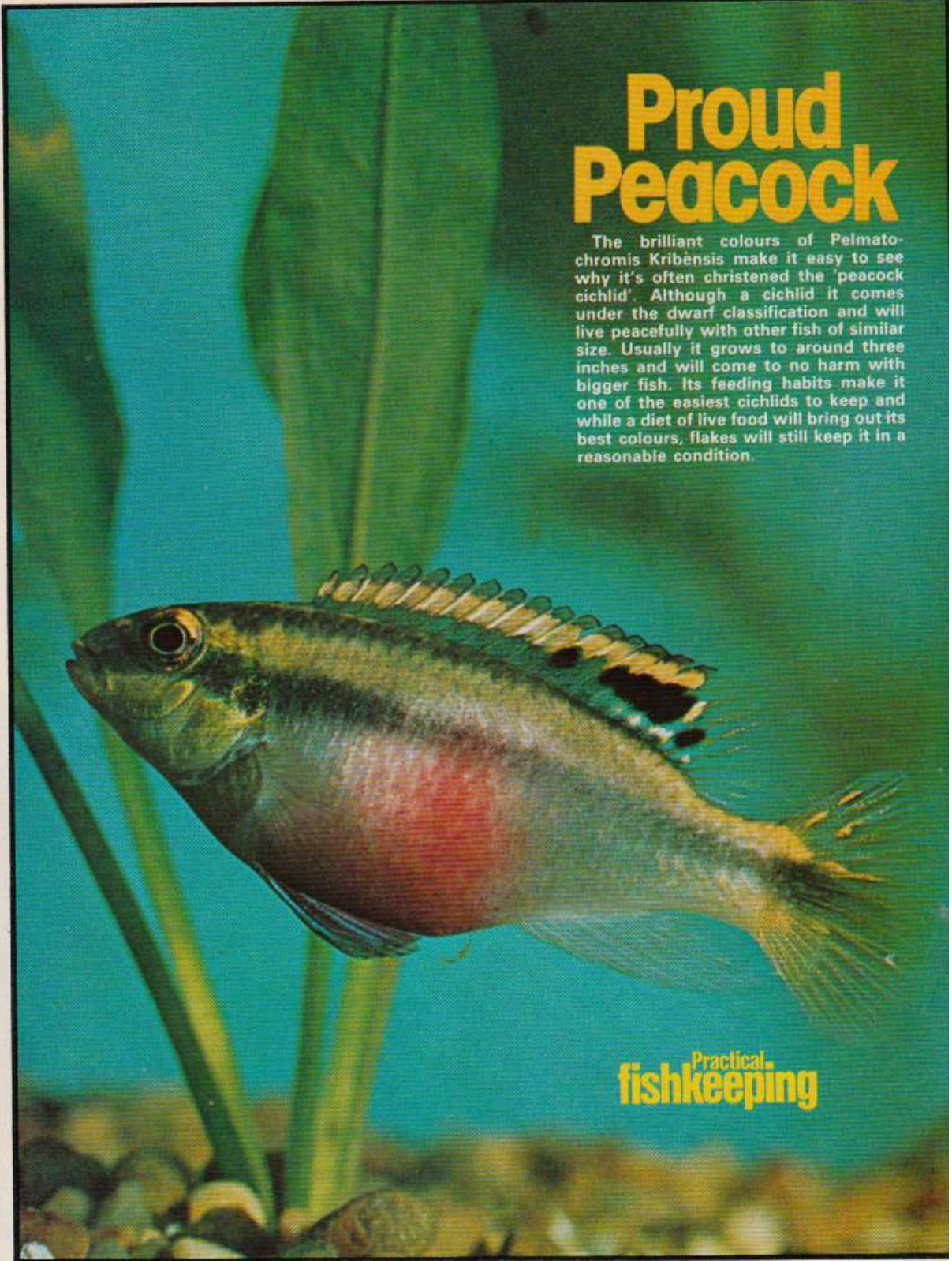


● Malawi

● Above: The Discus

# Proud Peacock

The brilliant colours of *Pelmatochromis Kribensis* make it easy to see why it's often christened the 'peacock cichlid'. Although a cichlid it comes under the dwarf classification and will live peacefully with other fish of similar size. Usually it grows to around three inches and will come to no harm with bigger fish. Its feeding habits make it one of the easiest cichlids to keep and while a diet of live food will bring out its best colours, flakes will still keep it in a reasonable condition.



Practical  
fishkeeping



Write to:

# Letters

## Compulsive cichlids

IT would be interesting to hear how readers progress from one tank to several. I'm sure it's not entirely a voluntary choice. Speaking from personal experience, I cannot resist buying cichlids — and that's why my one tank quickly expanded to two, to take up some young, but 'Bolshie' severums.

Fair enough, I now had one well stocked tank and one with just a pair of cichlids. They looked lost, so soon they were joined by two blue acaras. All went well until I saw a young pair of Jack Dempseys at a bargain price. Knowing these cichlids' reputation I should have known better, but the inevitable happened. Home they came, and scarcely were they put in the tank with the other cichlids than they began scrapping true to their name.

At this point, fate stepped in. I was able to pick up a very good, all glass tank through the small ads, and once set up, this became the home for the Dempseys. I now had two well stocked tanks and one with just a pair of cichlids... you can guess the rest of the story. I decided that there must be other cichlids compatible with Jack Dempseys, and in a moment of rashness, purchased a pair of convicts.

There is one final twist — instead of the Dempseys bullying the convicts, the exact reverse happened. So now I'm on the lookout for yet another tank, and dreading the next quarterly electricity bill. I've heard of Alcoholics Anonymous, but does a similar organisation exist to curb compulsive cichlid buyers? — N. J. Cooke, Luton, Beds.



No good publication is the same without a lively letters page. We want you, the readers to have your say — to tell us of your views and experiences. So come on! Put pen to paper.

## Developments with ozone

AS a marine aquarist of some eight years now, I would like to tell you of some interesting developments regarding the use of ozone in the marine aquarium. I have a "Sander" Mk.2 ozoniser, which I have had some three years now. I purchased the ozoniser as an extra "weapon" to help me within the hobby of marine tropicals. I must point out that before I purchased the ozoniser I read and reread the values and dangers of the use (and misuse) of ozone, from books and articles that I came across.

The Sander ozoniser has m/gph (Milligrammes per hour) values of from 3 m/gph to 25 m/gph, although personally I

would never use more than 15 m/gph of ozone due to the dangers both to the aquatic animals in the system being treated and to human animals who can suffer nausea and headaches due to this high concentration of ozone.

Most aquarists generally use the name "ozone", but there is another term, and this is Triatomic oxygen O<sup>3</sup> and this means that the extra oxygen atom in the ozone reacts with the organic compound and "oxidises" or "burns" it, leaving a now stable (where it was originally unstable at ozone O<sup>3</sup>) molecule O<sup>2</sup> behind. Ozone is an unstable, powerful oxidising agent capable of destroying bacteria, protozoans and many other organic compounds.

I have had some rather conflicting experiences using ozone in my marine systems. During the summer of 1977 I purchased a fine specimen of maroon clownfish. After a few weeks the fish developed Oodinium on the head region just below the white head band. Ozone was used continually for four days at 5 m/gph with short bursts of 10 m/gph. The fish was fully cured and recovered to full health after the duration of the four days.

Recently this year I used ozone at 5 m/gph after introducing some fan worms and living corals (Breuin coral) to my system. The ozone was used for two days. In that time the worms and corals did not feed, ie by extending tentacles/feathery appendages and polyps. After the ozone was discontinued for a few hours the invertebrates began to feed in the normal way on the Ligtury marine that I feed them on. — A. J. Maddock, Fulwood, Preston, Lancs.

## NEWS EXTRA

THE Sheffield-based Sheaf Valley AS are holding their 16th open show on February 11 at the Dormer Twist Drill Ltd premises at Cemetery Road, Sheffield. Benching is from 12 mid-day to 2 p.m.

Further details are available from **D Golland**, 70 Glenview Road, Greenhill, Sheffield.

HIGHLIGHT of the Croydon DAS meeting was the dissection and examination of an adult piranha.

Members, together with guests from the neighbouring Kingston, Redhill, Roehampton and South London clubs, studied the fish carefully, but could find no cause of death.

Characin Study Society member **John Pollard**, who provided the fish and the equipment to examine it, finally revealed that the piranha had been accidentally electrocuted.

If any other clubs would like a similar demonstration and slide show by the society, contact secretary **D McKay**, at 51 Mount Road, New Malden, Surrey.

CLEVELAND's Middlesbrough AS have just announced their newly-elected club officials. They are: chairman, **D Rockham**; secretary, **S Cook**; treasurer, **R Paxton**; show secretary, **A Stevens**.

Meetings are every Wednesday at 7.30 p.m. at Dorman's Museum, Middlesbrough. Anyone interested in joining can also contact secretary **S Cook** at 19 Berner Street, Middlesbrough, Cleveland (telephone Middlesbrough 826938).

# Diary Dates

### JANUARY

**Saturday, January 20:** The Goldfish Society of Great Britain, general meeting, Conway Hall, Red Lion Square, Holborn, London, 2 pm.

### FEBRUARY

**Tuesday, February 6:** Peterborough Fishkeepers' Association will meet at 7.30 pm at the Royal Oak, Lincoln Road, Walton, Peterborough. An illustrated talk on pond construction and keeping koi will be given by Eric and Hilda Allen, former chairman and secretary respectively of the British Koi-Keepers' Society. All visitors welcome.

### MARCH

**Saturday, March 17:** The Goldfish Society of Great Britain AGM, Conway Hall, Red Lion Square, Holborn, London.

PRACTICAL FISHKEEPING

**Saturday, March 31:** Croydon Aquarist Society annual open show. Schedules from Trevor Skeet, 64 Summer Road, West Croydon, Surrey. Tel: 01-681 7861. and Les Derrick 5 Clenthorpe Avenue, Croydon. Tel: 01-654 0984.

### APRIL

**Sunday, April 1:** Reading and District A.S. open show at St. Peter's School, Church Road, Earley, Nr. Reading. Schedules from P. C. Rushbrooke, 34 Melrose Gardens, Arborfield Cross, Berks. Tel: Arborfield Cross 760303.

**Sunday, April 15:** Stockton-on-Tees 14th open show at the Kiora Community Centre, Roseworth Estate, Stockton. Schedules from D. Knibbs, 15 Gray Street, Norton, Stockton, Cleveland. Tel: Stockton 551009.

**Saturday, April 28:** Southend, Leigh and

District A.S. open show, at St. Clements Hall, Leigh on Sea, Essex. Further details from Ray Stanford, 1 Hilary Close, Rochford, Essex. Tel: 0702-546090.

**Sunday, April 29:** Half Moon A.S., Billingham Green, Teesside, open show, in the Corporation Hall, West Row, Stockton, Cleveland. Schedules from C. W. Buck, 22 Danby Grove, Thornaby, Cleveland. Tel: Stockton 65284.

**Sunday, April 29:** Corby and District A.S. open show at Corby Civic Centre. Schedules (from early March) from C. MacAllister, 18 Maidford Road, Corby.

### MAY

**Saturday, May 12:** Tonbridge and District A.S. fish exhibition, Lambeth Walk, High Street, Tonbridge. Further details from the secretary, Mrs. B. M. Purchase, 6 Albert Road, Tonbridge, Kent, TN9 2SR. Tel: Tonbridge 358225.

**Saturday, May 12:** Port Talbot A.S. open show at the Taibach County Youth Centre, Margam Road, Port Talbot, West Glamorgan. Schedules available from early March, from show secretary A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, West Glamorgan. Tel: 3752.

**Sunday, May 20:** Gloucester Aquarist Society open show, at Chequers Bridge Centre, Painswick Road, Gloucester. 31 classes to F.B.A.S. ruling. Trophies for 1st and 2nd plus award

cards. Dr. D. M. Ford will give a slide talk on Aquaria around the World during judging. Schedules, from March, from S. Grainger, 2/10 Bazeley Road, Matson, Gloucester.

**Sunday, May 20:** Caer Ufa A.S. open show at the Chuter Ede Community Centre, Benton Road, Whiteleas Estate, South Shields. Schedules from G. Wright, 19 Sydney Street, Boldon Colliery, Tyne & Wear.

### JUNE

**Saturday, June 16:** London's South Park Aquatic Study Society, open show, at the Community Centre, St. George's Road, Wembleton, London SW19. Show secretary L. Clapp, asks anyone still holding cups from the last show to return them by Tuesday, May 15, to him at 16 Overhill Way, Beckenham, Kent. Tel: 01-657 4404.

### JULY

**Saturday, July 21:** The Goldfish Society of Great Britain, general meeting, at Conway Hall, Red Lion Square, Holborn, London.

### SEPTEMBER

**Sunday, September 2:** Bethnal Green Aquatic Society, open show. Contact Peter Riley, 1 Hartford Street, London E1. Tel: 520 8911 Ext 1633 for details.

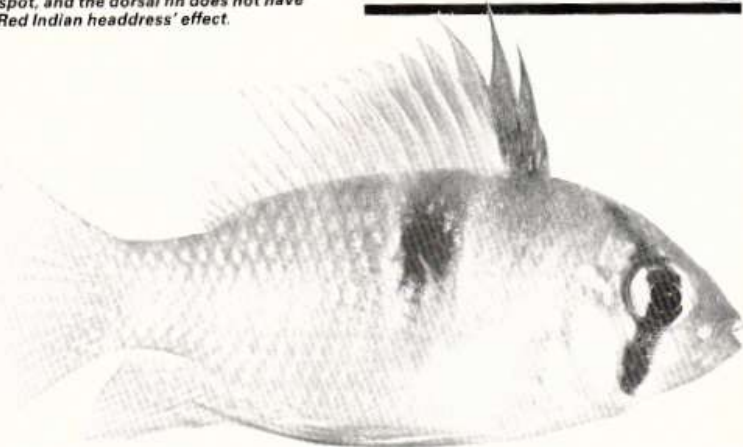
### NOVEMBER

**Saturday, November 17:** The Goldfish Society of Great Britain, general meeting, at Conway Hall, Red Lion Square, Holborn, London.

# SPOTLIGHT

## on breeding

*The male ram. Note the elongated dorsal spine, and the plain dark spot on the fish's side. The female has iridescent flecks in the side spot, and the dorsal fin does not have the 'Red Indian headdress' effect.*



# Rearing Rams and Albino Catfish

by Don Martin



*At little more than an inch long, this delightful Albino catfish is one of the species dealt with in this article on spawning.*

40

SOME of the more commonly kept community fish are, nevertheless, quite pricey to buy — the reason being that they have the reputation of being difficult to spawn. But, as said last month, you never know until you try.

The fish I propose to discuss this time are the scavenging catfish, *Corydoras aeneus*, and the dwarf cichlid, *Apistogramma ramirezi* known popularly as the 'ram'. You couldn't hope to find more divergent spawners, but the common difficulty has always been to prevent the fertile eggs 'going off'. I have come to the conclusion, borne out by results, that you can literally kill off whole broods by being over cautious.

First, then, the ram — and problem one is to ensure you have a pair. Books will tell you that the male is the one with the elongated spine on the dorsal fin, but a more reliable way to tell the sexes apart is to look at the dark spot on the fishes' side when they are at rest. In the male ram, the spot is almost pure black. In the female, the black spot is suffused with tiny blue dots.

Many of the larger cichlids don't take to one another, even if you segregate a true pair, but with rams there is no such problem. I just take the best looking of the bunch, condition them for few days on whiteworm and flake food then put them together. The tank is quite small, only 18 inches by 10, with a small bio-filter in the corner filled with charcoal and glass wool. But the water needs to be right. Rams are delicate fish at the best of times, and don't like sudden changes of water temperature or composition. They protest in the best way they know how, by dying off.

I use old tap water from a community tank. In Norwich, this has a pH of 7.4, and goes nearly neutral after being left to stand for a week or two. Temperature in the breeding tank is 80°F.

I give the adult fish a few pieces of plant — anything they can hide in is suitable — but put no gravel in the tank. I find this makes it very difficult to see the newly hatched fry later on.

For the spawning site proper, I give the ram a piece of earthenware flowerpot, which I laid so that the concave surface is uppermost. For some reason, this shallow depression is what they like. You could even use a bit of coconut shell, but I find plastic flowerpots aren't so good — the eggs don't adhere to them.

The fish are in no hurry to spawn — it may be a week to ten days before they clean off the spawning site and lay their amber-coloured eggs. But when this happens, I do not leave the parents in the tank, even though dwarf cichlids have a strong protective instinct towards their young. Out go the adult fish at the filter, which is replaced by an airstone. At this stage I cover the tank so that the eggs and subsequent fry are not exposed to light.

Many aquarists will tell you that unless you add methylene blue or other antiseptic chemical to the water, the eggs will become fungusy. I find all that chemicals do is to reduce the number of fish you can bring off, and I think my last figure, 400 young from a single spawning, speaks for itself.

The fry are fed for the first two or three days with liquid food, going on to micro worm and newly hatched brine shrimp. But I overlap the liquid feeding into stage two, for the fry do always develop at the same rate. In fact young rams are quite slow growing, and well over three months before they are ready to go into a community tank.

With hundreds of fry from one spawning it's obvious that the 18 x 10 tank isn't going to support them all, so once they are free swimming, I thin them out at about 110 fish a 3ft tank. I catch the youngsters in a fine mesh net — the same one I use for daphnia — and then put them into their new home via a siphon.

PRACTICAL FISHKEEPING

plastic tea strainer. That's when I make the head count.

*Corydoras aeneus* are a bronze catfish, but the variety I spawn are albinos — a nice, silvery white colour. I haven't tried breeding any other *Corydoras* varieties, but I would imagine the method I am about to describe would work for *C. paleatus*, *C. julii*, *C. melanistius* and *C. reticulatus*. I deliberately didn't say I was going to tell you 'how' to spawn these fish, for, to tell the truth, there are certain aspects of the courtship ritual that no-one has been able to fathom.

Telling the sexes of *Corydoras* apart is quite easy. Particularly after the fish have been conditioned up on white worms, the males remain nice and slim, while the females, viewed from above, look very matronly. The spawning tank isn't a tank at all, in my case, but an old glass battery case measuring 13 x 9 x 15 inches deep. I've had it for 20 years.

As for the rams, I use old tap water which has been well aerated. The pH is around 7.2. Evening is the time to introduce the adult fish, and I go the whole hog and put in three pairs. At the relatively cool temperature of 72°F, it takes four days before any activity begins. Then the fish start shooting up and down the sides of the bare tank, with the females doing most of the chasing. Next, the pair form a 'T' shape, with the mouth of the female close to the vent of the male. This may be the time when the sperm is shed, for the next thing you see is the cluster of eggs clasped between the female's ventral fins.

The female goes all round the tank, occasionally cleaning off the glass and transferring eggs to the side. It seems likely that sperm from the female's mouth is also brought to the glass during the cleaning off operations, and that the eggs are fertilised by this alone.

The spawning can last for several hours, with the fish taking a break and resuming operations. So don't be tempted to remove the parents too soon, or they may continue to place eggs in the community tank, where they will soon be eaten.

The eggs are a peculiar opaque white, and this led me into thinking, the first time I tried spawning *Corydoras*, that they must have fungused. What I have since realised is that this is quite natural, and that, as with rams, putting chemicals in the water will do more harm than good. All I do, once the parent fish are removed, is to raise the temperature to 80°F and leave well alone.

After three or four days, it's obvious that the apparently infertile eggs are going to hatch. You can see the tails of the emergent fry wiggling. Once most of the young fish have hatched and dropped to the bottom of the tank, you will be convinced that there are still many 'fungused' eggs clinging to the side, but these are, in fact, only the empty shells.

The fry are especially tiny. To give you an idea, they are about the size of the bristles you see in the sink when you wash your razor, only a silvery colour. Good filtration is necessary, because feeding of the parent fish before they spawn can lead to cloudy water. A sponge filter is the best, with an added airstone in the tank.

Like rams, young *Corydoras* are started on liquid food, and later brine shrimp and micro worm. After about ten weeks, they are ¾ of an inch long, and will take dried food. But don't just drop it in the tank, or the young fish will tend to get constipated. Moisten it first, so that it sinks straight to the bottom.

I know it sounds silly, since you will say that the food gets wet anyway when it's put in the tank. But watching young fish take dried food straight from the surface, it's obvious by their jerky movements that they are disturbed until their digestive systems put back the missing moisture.

PRACTICAL FISHKEEPING



*With tropicals requiring so much attention, it's not often that Don Martin has time to relax by his garden pond. The dense lily pad cover means the fish remain comfortable even in the hottest weather — which at this time of year is only a fond memory.*



*Since he retired from the Norwich City Police, 56-year-old Don Martin has developed a fish-breeding business specialising in community species that will get along together in the tank. His successes include Harlequins, Rams, Kribensis, *Corydoras* and, perhaps most significant, the South American bristle nose catfish, *Ancistrus Lineolatus*. Don reckons he owes a lot of his success to experiment, intuition, and not relying too much on what the books say. Consequently, some of his methods are unorthodox — but they work.*

# A hobby that won't break the bank

With the beginner in mind- by Nick Fletcher

Your first tank — how much it will cost

Prices based on a provincial aquatic dealer.

Tank 24 x 12 x 12 .....	£9.00
Filter (under-gravel) .....	£1.90
Lighting (tungsten with harness) .....	£2.50
Heater/Thermostat .....	£5.60
Pump .....	£2.50
Junction Box .....	£2.00
Rocks (10 lb at 10p per lb) .....	£1.00
Gravel (20 lb at 5p per lb) .....	£1.00
Plants (basic selection) .....	£2.00
Thermometer .....	75p
Airline Tubing (two metres) .....	20p
Plug .....	40p

TOTAL £28.85

DON'T worry that starting off on the tropical fish hobby is going to break the bank — it isn't expensive to set up your first tank, and once you've bought all the necessary 'hardware', running costs are negligible.

But it's still reassuring to know exactly how much you will have to lay out before your first fish are swimming around in their new home. This article deals with two classes of item — necessities; and desirable, but optional extras. The latter can be bought once your tank is set up, with one exception — the stand.

You will have to decide right at the offset whether your tank will be placed on a shelf or strong table, or whether it is best suited to one of the purpose built metal frame stands. Because once your tank is full of water, rocks and gravel, any attempt to move it will result in disaster and possibly a visit to the outpatients' department.

Assuming, however, that you dispense with the stand, it will cost you £35 — give or take a pound or two — to set up an all-glass, 24 x 12 x 12 tank with under-gravel filtration, neon lighting, heater-thermostat, pump, rocks, plants and gravel.

The cost is broken down like this:

**TANK:** One of the modern, all-glass tanks averages out at £9 (new). Angle-iron framed tanks are that much dearer, but now that sealants have been perfected, there is no reason why the latter are necessary in the dimensions described above.

**FILTER:** An under-gravel filter to fit a 24-inch tank will set you back £1.90. This is a bigger outlay than if you were to opt for a box filter (49-85p) but with the latter you will also have to buy activated charcoal (21p a small packet) and filter wool (18p). Both these items have to be renewed, whereas once an under-gravel filter is installed, that's it.

● White Cloud Mountain Minnows will make ideal starters for your community tank. Cost: around 30p.

● Traditional alcohol thermometer

● Single outlet air pump

● Light tube and fixtures

**LIGHTING:** Tungsten tubes are £1 each. The harness, to house the tube and take the wiring connection, is another £1.50 or so.

**HEATER/THERMOSTAT:** The higher the wattage, the higher the price, but for a 24 x 12 x 12 tank, 150 watts should be adequate. For your money (£5.60) you get a precision instrument that can be set to any temperature you require and which is wired to British Standard safety precautions. Separate heaters and thermostats are, in my view, out of date. Never buy this equipment second-hand. Old heaters are often not properly earthed.

**PUMP:** Pumps are made with single, double or multiple air outlets. A single outlet is all that is necessary at this stage, and you can expect to pay anything between £2.50 and £5 for such a pump. Ask your dealer before you buy whether your chosen model is silent and powerful for its size.

**JUNCTION BOX:** This is not strictly necessary, but such a useful item that it has been included as such. This piece of electrical gadgetry enables you to run a tank from a single power-point. The mains cable runs into a console from which separate wires lead off to your heater, lights and pump. The assembly clips neatly on to the side of the tank, out of reach of curious hands or the family cat. Depending on whether or not you buy one with a neon indicator light, it will cost you £1.80 or a little over £2.

**ROCKS:** Always buy from your dealer, unless you are an expert geologist. The wrong type of rock, however pretty, can upset the pH balance of the water and knock out the fish. Depending on type, expect to pay between 10 and 15p a pound. About 10 lb of rock is the minimum you should consider for your tank.

**GRAVEL:** Much the same applies — ordinary brown gravel is about 5p a pound, more

for the more colourful varieties.

**PLANTS:** The cheapest plants your dealer will stock are varieties like cabomba or elodea (6p a root). Assuming you also have one or two of the dearer, but more spectacular varieties, like Amazon sword, you could plant out your tank properly for around £2. Most beginners underplant. Don't be one of them.

**THERMOMETER:** The modern, chemical thermometer sticks on the tank glass and gives you a reading accurate to within a few degrees. It costs about 75p.

To conclude this section, sundries must be mentioned like plastic airline tubing (10p a metre) and fused, electric plugs (35-50p).

Once you have got this far, you will have parted with about £30. The next section of items will add to your pleasure, and you will probably buy some or all of them within a short time of setting up your tank.

**NETS:** Useful for catching your fish to transfer from tank to tank, these cost between 20p and 60p. Buy two, a large and a small, so that the fish are not squashed against the side of the tank during attempts at removal.

**SIPHONING SET:** This is for getting uneaten food and general muck off the bottom of the tank, and will cost you about £1.65. An alternative is the power cleaner (£1.45) which works off the pump.

**DRIP TRAY:** This is a device that fits over the top of the tank between the water and the lighting unit, and prevents condensation forming. For our 24 inch tank, you will pay 80p for one of these.

**ALGAE SCRAPER:** This does as its name suggests, and clears the sides of your tank of green algae which forms if the tank is exposed to strong light. Pay about 40p, or use an old disposable razor, which is just as good.

**BREEDING TRAP:** If you have livebearers in

your tank, sooner or later the females are going to drop young. If you don't want to see them all disappear down hungry throats, the answer is a breeding trap, into which the pregnant female fish goes just before she gives birth. Depending on size, a trap will cost upwards of 80p, the more expensive models being partitioned to separate the parent fish from its brood.

**SPECIAL LIGHTING:** As an alternative to an ordinary tungsten light, many fishkeepers prefer lighting of the 'Grolux' type, which enhances certain colours of the spectrum and encourages the growth of plants. These lights cannot run through the mains direct: the current has to pass through a control box (£5.90) before it reaches the tube (£2). So this lighting is not cheap, though many swear by it.

I have not yet mentioned the cost of fish. It would be impossible to price even the commonest varieties absolutely accurately, since every dealer has his 'bargain fish' and more expensive stock. Much depends, too, on seasonal availability. But if you are making a modest start, with livebearers, barbs and tetras, about 35p per fish is not far out.

Finally there is your option of buying equipment second-hand. There are, undoubtedly, bargains to be had in the small-ad columns of your local paper. They are often in the nature of a 'package deal' . . . "Bargain — fish tank, heaters, fish and extras, £20 or near offer." The owner may be moving house and cannot transport a bulky tank hundreds of miles.

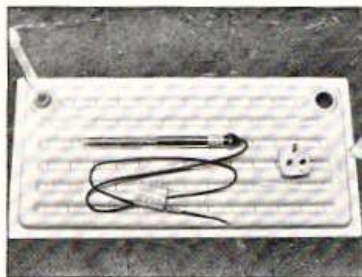
Equally, he may be trying to unload a leaky tank full of diseased fish on to an unsuspecting beginner. So the best plan, if you attempt to buy second hand, is to take along someone who really knows what he is doing.



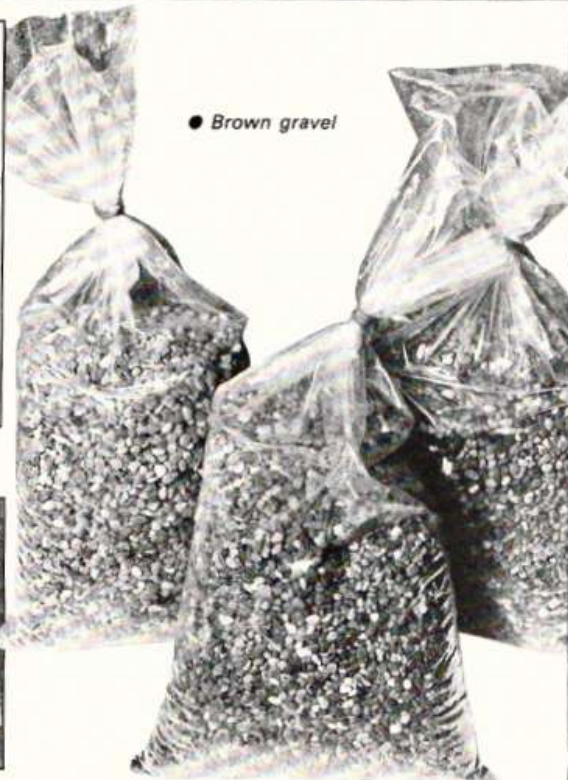
● A selection of plants



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● Undergravel filter and heater



● Brown gravel

AMARILLO is the common name of a member of the Family of Goodeidae, *Limnurgus innotatus*. This species is still relatively rare as far as aquarists are concerned, being somewhat of a difficult species to maintain in good condition and to breed.

In its native Mexico, it is still used as food, in large numbers as it grows to only about 30mm, males, and 70mm, females. The sizes of aquaria-bred specimens to date are only about two-thirds of these sizes, at most. It is not a species for general hobbyists, but rather for the specialist. It prefers to be housed separately from other species and I would not recommend it as a Community tank fish as it tends to be shy, wastes away and dies. It is, therefore, unlikely to appear to any extent in dealers' tanks.

According to Kurt Jacobs book, "Livebearing Aquarium Fishes", it was first discovered in 1860, location Mexico City, being then described by Bleeker. Only a line drawing is included in that Book. Very little information is given, beyond size, colour and the fact that it can be found in brackish and strongly saline water as well as in fresh water.

Being short of original wild specimens I have not experimented with salt water at all. The background colour is grey/brown. The male at times can be completely black all over, including finnage, and this seems to be a sign that conditions are right, rather than solely a sex-attraction colourisation. The females sometimes show black on the under-belly. As far as I know this species has been brought into this country only by Mr. H. Preston, who collected it in 1974/5, over 100 years after it was first discovered. Strangely enough he also collected specimens in Mexico City. Conditions

# The Amarillo

close-up on a little known livebearer from Mexico City — by David Cheswright

where collected were fairly polluted and water had to be changed to keep them alive. Salt was added by Mr. Preston whilst the fish were in transit. The species was present at the location in very large numbers.

As with all Goodeas the gonopodium of the male is merely a notch at the front of the Anal fin. The male also has larger dorsal and anal fins than the female and this difference enables the males to be recognised when quite small, at about one month old.

The specimens collected were of quite good size and quality on arrival and were for the first year reasonably "easy" to breed. Because of what seems to be something missing in aquaria conditions, they have not yet become what could be called a "show" fish. The males, in particular, are very thin-bodied, and the females have a strange lumpy appearance when pregnant or are extremely thin and hollow-bellied when not.

Success was not long-lived and by late 1976 there were not more than about six specimens left. The remainder were gathered in by Mr. Preston and deposited with me at Wickford, Essex.

Some fry were obtained and the stocks have now been built up to about 100, about half of which are with other aquarists, in the form of pairs or fry, in various

parts of the country. Some of those have bred but not to any great extent. Fry have been reported in Bristol, the Rhonda and in Burnley, the latter being all males. Practically all pairs distributed in 1977 died within a short time. My opinion is that this difficult fish has acclimatised itself to my conditions and is only now doing so to conditions in other areas.

The females, being Goodeas, feed their developing fry inside their bodies where they are attached by a feathery sort of "cord". Females should never be moved when near to giving birth as premature births are much more likely with all species of Goodeas than with other Livebearers.

This often results in dead, small or improperly formed fry. A sure sign of premature birth is that part of the "cord" is still attached to the fry. This is drops off soon after birth if the fry survives.

The gestation period at a temperature of around 72F (22C) is about eight weeks. Fry are about 10mm in length at birth, some being even larger, and there always seem to be one or two very small fry and usually one or two dead ones. The size of the fry in relation to that of the Female is even more marked with this than with other species of Goodea. It may be that, because of something lacking in food or other conditions, large fry are still produced, to the detriment of the mother. One would have expected smaller fry from smaller females.

They are mature from about four months old. The number of fry varies with the size of the female, being from six to 18 per brood. It is noticeable that the larger the brood the greater the variation in sizes. Very seldom are any fry eaten by the mother, but other "Amarillos" in the same tank will eat the fry when first born. I often find a few fry with the adults which proves this point. Over the period I have found that the conditions which appear to suit it or at least keep the strain in existence are:—

- Clean conditions with medium aeration and plant life.
- Temperature about 72F (22C)
- No direct sunlight. They appear to do best in a tank have in a darkish corner of the shed almost on the floor.
- A good variety of live and dry foods. They do not do well solely on dry foods. They really enjoy larvae such as glass worms, rather than daphnia and quite small fry will tackle large food.
- Regular weekly water change: of about 10%.
- Females should be separated at least two weeks before fry should arrive and left alone to recover for a couple of days or more after they are born. The females are very thin and weak-looking after giving birth.
- Being Goodeas a new fertilisation is required for each brood
- This is not a fast swimming fish and the fry seem to do better in a small tank, say 10 x 8" x 8", with water change for the first couple of weeks. Here they can easily find food. Some fry do not swim properly for about two days after birth but, by then, this has usually been corrected. Although the strain seems to be slowly becoming stronger new wild specimens to provide new blood would be useful. No line-breeding has been attempted and I always keep several pairs in one tank in the hopes that some sort of "natural" selection will occur to improve them. I ensure the increased stock of the interesting species has taken much time and thought apart from devoting six aquaria plus smaller nursery tanks to it.
- In October/November, 1971 several pairs and fry were taken to West Germany as this species has not been seen there before and awaiting with interest a report of their success or otherwise.
- It is interesting to note that Mr Preston also brought from the wild another Goodea, *Limnurgus Multiradiatus*. This is similar in shape and finnage to the "Amarillo".

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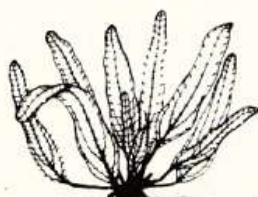
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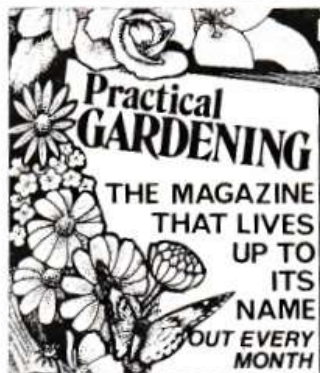
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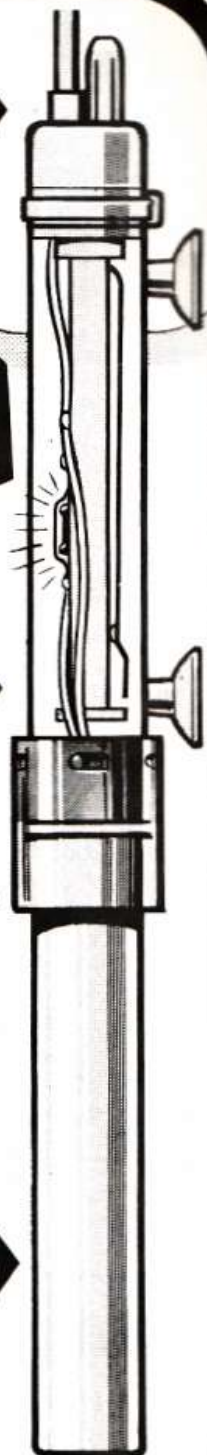
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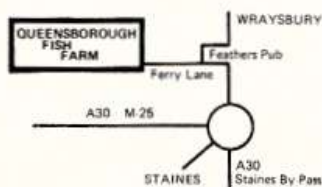
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