

DECEMBER 1986 95p

AQUARIST

AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

Easily
Spawned Goby

SEXING

MARINE FISH

Spotlight on the Ram

WINTER KOI CARE

Keeping and breeding
Fire Salamanders

FREE INTERPET COMPETITION

PUBLISHER
Andrew Blair
MANAGING EDITOR
Val Williams
EDITOR
John A. Dawes
PRODUCTION EDITOR
Paul Davies
PRODUCTION MANAGER
Christopher Benn
ADVERTISEMENT MANAGER
John E. Young

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Cover Story

Photograph by David Allison
The impressive and somewhat
aggressive-looking fish on our cover
this month is *Odonus niger*,
commonly known, because of its
variable coloration, as the Black,
Green or Blue Trigger. Despite its
appearance, *O. niger* can be housed in
a community tank, albeit with similar-
sized fish. Invertebrates, with the
exception of large anemones, are,
however, out of the question, since
this 8-inch Red Sea and Indo-Pacific
species has a particular liking for
shellfish and crustaceans. Red Sea
specimens should be kept in water
with a specific gravity of 1.025 (or
slightly higher), while Indo-Pacific
ones require the more usual range of
1.020-1.022.



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DECEMBER 1986 Vol. 51 No. 9

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PEACE ON EARTH?

By Amanda Grimes

When I set up my very first aquarium, it was just before Christmas. I do things like that. In many ways, my life is like a Thomas Hardy novel; just when it's important that they meet, the main characters miss each other at the crossroads. Only in my case, people don't come into it. I go down one road; logic decides on the other...

Throughout my school years, my English teachers urged me to take up writing as a career. I resisted this silly idea, set my heart on something anonymous like discovering life on the Moon, and got a job in Fleet Street within three months of leaving school. Some years later, I took up professional gardening — in November. So it follows that I would pick the busiest time of the year to embark on fishkeeping.

As I had spent all my money on the tank, stand and Yuletide unavoidable — gifts, food and spare tree-light bulbs (push-in and screw-in — is there a conspiracy here?) — I asked for tank equipment for Christmas. And because I wanted the tank ready before Christmas, I got all my presents early.

In the face of the impossible task of disguising these items, my family and friends resorted to cunning. Two parcels were labelled, "May the force be with you..." Great, two truncheons, I thought, just what I always wanted, unwrapping the Grolux tubes and checking out of the window for flashing blue lights. Two more announced: "Blow the tanks!" I puzzled over this one — either someone was rebelling against my list or I had been made a terrorist and given two land-mines. I unwrapped a pair of ballast units — a subtle play on words. The small package labelled "Smart copy" had me revising my present list: "I'll give this cheap-skate a box of well-matured Camembert". I crossed this out when the contents were revealed — a Slik-Stat...

The long and short of this family one-upmanship was that my tank was ready and stocked about a week before Christmas Day. Some of my fish were bought, many were donated — refer back to chronic money shortage. Among the donations were a pair of Black Mollies. I can honestly say, hand on heart, in all truthfulness etc. etc.

that at the time there would have been absolutely no possibility whatsoever that, when it came to actually buying Black Mollies, I would have had any doubt in my mind — I would have bought half a dozen. They're so different, so stylish, so... black. And they're so...

Christmas Eve went like a dream. The tree-lights didn't blow, the turkey eventually thawed, we remembered — in a miraculous flash of lucidity — where we'd hidden the drink and we'd wired up a small light in my Nativity scene. We sat around contented and tired, each wrapped in our thoughts — or the film on TV (which is usually a repeat, so I was deep in thought). My thoughts being about as systematic and controlled as a fox in a chicken house, these ranged from "Thank God I wasn't born in the Lebanon", through "Haven't I seen this film before?" and "Will I be miserable tomorrow as I've opened all my presents?" to "Maybe I should feed the fish and turn their lights out". I had seen the film before, so I went through to see to the tank.

Crouching down to enjoy the feeding frenzy, it struck me that the occupants were unusually quiet. They were ignoring the snowflake fall of food and sat quietly in the

water, peering into the glass at the top of the tank. Something moved and a Barb leapt forward and snatched it up. Then my eye was caught by a Siamese Fighter. He was as still and predatory as a cat, having taken up a position in front of a large Amazon Sword leaf which had a hole in it — and was watching the hole. I had switched off the front tube and the lighting from the back of the tank was throwing strange shadows onto the leaf. Then it dawned on me. There were minute fish behind the leaf.

Prolific... that's the other thing Black Mollies are. In the corner, the female was dropping what seemed like hundreds of young... or in this case, what must have been the best meal of the year for the other fish, including the male Molly. I was horrified and disgusted. I couldn't do anything to help them. The only other aquarium in the flat was my sister's community tank and they would have met the same fate in there. I didn't even have a breeding trap to put the youngsters in.

About fifteen young Mollies survived that Christmas massacre. I put two Tubifex feeders in, as far up the tank as I could, and some found shelter in there. Others managed to find cracks in the rocks and had the sense to stay there. A few more I caught in a net, which I left propped in the water across the top of the tank. The race to save them went on all through Christmas.

As soon as the shops reopened, I bought a breeding trap and they grew on in there until big enough to be taken to a shop with their parents. I have never kept livebearers since.

I thought of those Mollies again last Christmas. I thanked God I wasn't born in Ethiopia. I watched a film I'd seen before and my mind wandered off on its own illogical track. We send aid; we invite friends and neighbours in to share our bounty; we bury the hatchet and hug people we'd be violently arguing with any other day of the year. The war zones of the world answer the call of thanksgiving and ceasefire. Nature? She just goes her own sweet way; the great leveller. Peace on Earth?

Christmas or not — the struggle for survival goes on unabated.



SHOW REPORT

BRITISH AQUARIST FESTIVAL 1986

In his introduction in the B.A.F. Programme Alan Darby, the organiser, stated that he believed this show to be the largest of its kind in the world. The hordes of people who attend on Saturday, which bore no comparison to the host of fish fanatics, who flocked in, or should I say, shoaled in on Sunday, surely justifies his claim.

The Exhibition Hall was, once again, the stage for the aquatic trade to tease and tempt us into new areas: Atlantis' new powerhead (very compact but with more oomph); King British's new Fish Treats and new wild-caught Blue-faced Heckel Discus, LMB Aquatics and Porters Aquariums with their hexagonal tank set-ups, (priced very competitively); numerous stands selling aquatic plants, coldwater and tropical fish... For many enthusiasts the *Corydoras panda* on Essington Aquatics' stand was the first sighting of this species.

Tetra's Information Centre, as well as 'Aquarian's' Advisory Service were, as ever, in evidence. Dr. Ford of 'Aquarian' also gave two lectures (both very well attended) on fish from over 20 different countries.

The Radio Manchester interviewer had fun talking to some of the public for a special programme on the hobby. It was also nice to see some faces from the past and especially Dr. John Wilkinson, ex-president of the FNAS, now 92 years young and Cliff "Whiplash" Walker, for a long time the B.A.F. organiser.

Club stands this year kept up the trend of smaller more compact units, but nevertheless, their ingenuity shone through. Tong-

Adrian Blake reports on one of the most successful shows ever staged at Belle Vue



ham A.S. with an excellent winter snow scene with working models were awarded first place in the tableaux competition, a nice reward for their long journey from Aldershot in Hampshire. The largest stand was Bradfords' circa 1940's aeroplane with tanks set where windows would be, complete with a Biggles lookalike in the cockpit. Bridgewater A.S.'s farmyard scene was very inventive, as was the Reading A.S. monster display which won second place.

Best fish in show was a beautiful catfish, *Pimelodus albifasciatus*, owned by Peter Moye of Basingstoke A.S. The Champion of Champions fish competition was also won by a Basingstoke member, Larry Gale, with a lovely coloured specimen of *Cichlasoma hartwegi*, from South America. The Catfish, Killifish and Livebearer Associations all had stands displaying their own specialist subjects. These proved very educational for the hobbyist interested in these groups of fishes. For the absolute novice the Aquarian learning maze proved very instructive with free broadsheets available and their Better Fishkeeping supplement issued with this magazine's November issue.

Comments heard around on Sunday varied from very good to excellent. The traders on Sunday evening all had that pleased look about them, while the stewards and officials had that tired look (not surprising after the work they had all put in). The F.N.A.S. are to be congratulated on providing the platform for a weekend of pleasure for thousands. I, for one, had my most enjoyable B.A.F. ever. Long may it continue.

Top, Best in Show, *Pimelodus albifasciatus* owned by Peter Moye of Basingstoke AS. Above, Champion of Champions, *Cichlasoma hartwegi* owned by Larry Gale also of Basingstoke AS. Below Left, the Tongham AS winter scene won the Tableaux Competition. Below Right, second place went to Reading AS monster display.



FULL RESULTS
NEXT MONTH

Coldwater jottings

New strains at the shows

Two great shows — Bristol AS and GSGB — rounded off a magnificent season for the coldwater scene. The standard of goldfish on the show-bench this year has been outstanding. All the popular varieties such as the Bristol Shubunkin and the Fantail were well-represented at both shows and it is refreshing to see the emergence in popularity of some of the lesser-known varieties.

It was significant that the calico colouring also seems to be gaining appeal among goldfish keepers.

I was particularly impressed by an exhibit of Calico Bubble-eyes and it would appear that the work of some of the goldfish importers is adding a new dimension to the hobby and at the same time attracting newcomers to the Goldfish.

The introduction of some of the more sensible derivatives of the species is to be applauded and it is to be hoped that new goldfish breeders will emerge to establish new British strains — with the same responsible approach adopted traditionally by breeders in this country.

Christmas bookshelf choices

The increasing interest in the coldwater aspects of the hobby has been reflected by the number of new publications which have been introduced throughout the year.

In addition, there are a few "old favourites" which seem to have continuous appeal. The following list provides a summary of those titles which I have reviewed in "Aquarist and Pondkeeper" over the last twelve months or so and will, hopefully, serve to assist you — or your nearest and dearest — with last-minute Christmas shopping!

The Fishkeeping Yearbook 1986 by John A. Dawes and Charles J. T. Copp. (Robert Royce Ltd. £5.95): a useful reference for all fishkeepers,



See 'Wool: protection for winter!' (Photograph: Stephen Smith)

listing all aspects of the hobby, from clubs and societies to publications, suppliers, and public aquaria.

Fancy Goldfish Culture by Frank W. Orme (Nimrod £8.50): the Goldfish keepers' "Bible", providing a wealth of practical information about breeding and rearing, construction of ponds and fish-houses, and feeding and diseases.

Cyclopaedia of Coldwater Fish and Pond Life by Frank W. Orme (Nimrod £8.50): an alphabetical index covering all aspects of aquatic life.

Goldfish and Koi by Frank W. Orme (Nimrod £1.50): the ideal beginners' reference at a budget price.

Understanding Koi by David E. Hulse and M. I. George (distributed by Staffordshire

Waterlife £4.95): buying and identifying Koi, pond construction, and filtration are all covered in this rich source of information.

A Fishkeeper's Guide to Garden Ponds by David Papworth (Salamander Books £3.95): essential reading if you are planning to build a pond next Spring. Don't lift a shovel until you've studied this!

A Fishkeeper's Guide to Coldwater Fishes by Dick Mills (Salamander Books £3.95): a refreshing view of the coldwater hobby, providing comprehensive information for the novice and seasoned coldwater fishkeeper alike.

Keeping Goldfish by Dick Mills (Blandford Press £3.95): a useful introduction to the broader aspects of keeping

Goldfish, for younger hobbyists who wish to develop their interest.

Coldwater Fish in the Home and Garden by Prof Werner Ladiges (Tetra Press £4.75 — mail order only): a useful introduction to the hobby and a pleasant addition to the coldwater library.

Wool: protection for winter!

Providing its own protection against the rigours of winter, the woolen fish, pictured, caught my eye during a carpet trade exhibition at Harrogate in September.

The fish — standing at around two-feet high — formed part of a centrepiece of a display of woollen carpet fibres. According to the stand representative the fish cost £2,000 to produce. I shall stick to breeding Goldfish!

Club secretaries please note . . .

Although we are at the end of the 1986 coldwater season, now is the time to look forward to the challenges which next year will bring.

The majority of clubs and societies throughout the country will be holding their annual general meetings at around this time of the year, so please do let me know of your society's revised membership details, and, if possible, an outline of scheduled events, talks and other items of interest to prospective members, for inclusion in "Coldwater Jottings".

I would also be pleased to hear about the activities of overseas societies, and about how coldwater fishkeeping is conducted in other parts of the world.

. . . And finally

A very Merry Christmas to all readers of "Aquarist and Pondkeeper" and a successful fishkeeping year throughout 1987.

Letters



A group of juvenile Convict Blennies or Philippines Neon Goby. Photograph: Martyn Haywood.

Convict Blennies may be Mouthbrooders

Some years ago, when I was working at SeAquariums, we had a 250-gallon community marine tank which included a pair of *Pholidichthys leucotaenia* (Convict Blenny).

This is the fish the Philippine exporters describe on their lists as Neon Gobies because of the horizontal black and silvery blue striping of the juveniles.

It appears these fish may be mouthbrooders.

The tank in question was in public view and a customer drew our attention to a group of 15 nearly half-inch fish hovering at the base of a dead coral head. These already showed the above-described colouring and when one of the black and silvery white hooped adults appeared, their identification was soon made.

Whenever another species approached, one of the parents would gather the fry in its mouth and return to the safety of a hole tunnelled beneath the coral head. Neither parent (the sexes are indistinguishable) was overtly aggressive to the other fishes, which included an adult Queen Angel and Wrasses, but both would firmly ward off any too inquisitive fish.

What the fry had fed upon to reach this stage is unknown, although the tank had been established for a number of years. Unfortunately, after five days there was no sign of the fry and blame was placed on the resident Comet Grouper (*Callopleuropterus alveolatus*).

Martyn Haywood,
Reflections Aquatic Centre,
232 North Lane,
Aldershot,
Hants.

Calling all Brackish Water Aquarists

May I bring to the attention of your readers the fact that a new specialist society is being proposed to cater for those aquarists who are interested in brackish water aquariums? This society (The International Brackish Water Aquarium Society) would be open to all aim of pooling their knowledge of brackish water fishes, invertebrates, and plants.

With the growing interest being shown by aquarists in this little-studied field of aquatics it was felt that a specialist society was needed to help those who wish to keep these aquaria but find it hard to find much information on the types of fishes etc. which can be kept and how they should be kept. The total sum of knowledge intended for the Brackish aquarist is contained in only one book and a handful of articles. It is, therefore, hoped that with the formation of The International Brackish Water Aquarium Society this situation will change.

We would like to hear from any interested persons wishing to participate in this venture whether they be everyday aquarists or "experts" wishing to help morally or substantially, for example, with articles or information.

Anyone who is interested can contact me at the address below (please enclose a S.A.E. with any correspondence) or Gordon Walker on (0563) 27448. Thank you very much.

David J. Curran,
45 Phoenix Place,
Newton Aycliffe,
Co. Durham,
DL5 4QL.

Irresponsible and Illegal Introductions

The following incident may be of interest to your readers.

Following a report from a member of the public, Thames



This magnificent tropical catfish was illegally released into a stream in Isleworth. Such action is also irresponsible and cruel. (Photograph: London Zoo Aquarium).

Water Authority Fisheries Department staff recently removed a live 70cm *Pseudorasbora niger* catfish from a stream in Isleworth (London). Normally an inhabitant of streams and rivers in tropical South America, this catfish had presumably been released by a hobbyist who could no longer accommodate it in his or her home aquarium.

Occurrences such as this are disturbing for a number of reasons. Not only is the introduction of live fish into an inland water without a licence from the local Water Authority illegal under the Salmon and Freshwater Fisheries Act, 1975, but such introductions of 'exotics' may also contravene the Wildlife and Countryside Act, 1981. Legalities aside, the introduction of an essentially tropical fish into a very untropical British stream is surely cruel. The fish was unlikely to live very long, and perhaps die a slow, lingering death. Hobbyists acting in this fashion are not only breaking the law, but are also acting in a very uncaring and irresponsible fashion.

Both the traders selling potentially large fish, and the hobbyists who buy them, must consider their responsibilities — particularly what will become of the fish when they grow. At the Zoo we often accept donations of large fish, but even we run out of space from time to time!

As a postscript, the above catfish was eventually delivered to the Zoo, but failed to survive longer than a few hours. A shame, since it was once a magnificent specimen.

Dr C. R. Andrews,
Assistant Curator,
London Zoo Aquarium.

Odd Spawning Behaviour in Gouramis

I keep a Gourami community tank and recently observed a sequence of events which I found very puzzling.

Both my male and female Honey Gourami were seen to build a nest together, with the assistance of both the Red and Dwarf Neon males. These were then chased away by the Honeys when they seemed to be getting too helpful.

It was observed that three other nests were also built. The male and female were seen going to all the nests in turn, adding more bubbles to each. Would all these nests be used for mating or were they decoys, as, at each nest, several false matings took place. During the many matings that took place overall, the male never attacked the female.

Every time the male went to each nest the female was always at his side. In the original nest about twenty eggs or so were laid, but the nest was then taken over by the male Red Gourami. On reading the last sentence some people may think that the Red Gourami had spawned in the nest, but this could not be so, for two reasons: (1) we have no Red females, and (2) our female Neon Gourami was not ready for spawning. The Red Gourami took over completely, chasing away all other fish, including the Honeys, that came too close.

The three other nests were inspected closely by the other fish in the tank, and this enabled the Honey Gouramis to spawn in a site where no nest had been built at all. Could this be a sign that these fish have the "intelligence" to build four decoy nests and, while the other fish take interest in these, spawn in a site with just weed for cover?

Has anyone experienced anything like this when spawning Gouramis (or any other fish for that matter)?

Dave Mignienne,
60 Croftleigh Avenue,
Purley,
Surrey.

Your questions answered

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

Your Questions Answered, The Aquarist & Pondkeeper, Buckley Press Ltd, 58 Fleet Street, London, EC4Y 1JU



TROPICAL
Dr David Ford



COLDWATER
Pauline Hodgkinson



PLANTS
Barry James



KOI
Roger Cleaver



MARINE
Graham Cox



DISCUS
Eberhard Schulze

Coldwater Keeping Fancy Goldfish

I have recently taken up keeping Fancy Goldfish, such as Lionheads, Bubble-eyes, Telescope-eyes, Shubunkins and Chocolate Orandas. Although I have scoured various sources of information, I have found it impossible to obtain many of the details associated with the basic maintenance of these types of fish.

Would you please give me some indication of how to maintain these fish in a healthy condition, avoiding problems such as those affecting the swim bladder?

There are several books on the subject of Fancy Goldfish but, if I could choose only two, then without doubt I would select *Fancy Goldfish Culture* by the late much-loved Frank W. Orme (distributed by Nimrod). The second book, *The Goldfish* by George F. Hervey and Jack Hems, is published by Faber & Faber.

Swim-bladder disorder is, unfortunately, a common complaint of the fancy varieties of the Goldfish, and is to do with the shape of the body, the air-sac being somewhat restricted. However, Common Goldfish, like the Comet and Shubunkins, are not normally sufferers unless, of course, they are chilled. Changing large amounts of water without making sure that there is no more than five degrees temperature difference between

the old and the new is one sure way of chilling the fish.

Basically, I would advise you to take care when purchasing new stock; try to make sure that they appear in good health. Always keep new fish well away from established stock for, at least, six weeks, using separate equipment at all times. Never overcrowd — small numbers of fish in a tank are easier to maintain, suffer far less from ill-health and live longer. Partial water changes two or three times per week, with maintenance, such as disturbing gravel and siphoning bottom sediment about every ten days or so and cleaning out filter (if it is the box or outside type) will also help. Avoid overfeeding at all times. This is one of the largest fish killers around.



Fancy varieties of Goldfish (this is a Pearlscale) are more susceptible to swim bladder disorders than less fancy ones, such as the Common Goldfish, Comets and Shubunkins.

(Photograph: L. E. Perkins)

Blue Oranda hood growth

Do Blue Orandas develop a hood similar to that found in Lionheads?

The Blue Oranda is fast becoming popular with goldfish enthusiasts and some of the breeders of this type have been quite successful in producing good hood development. However, like any other type of goldfish which develops a hood growth, the actual degree of development varies from strain to strain and individual to individual. There can even be a tremendous difference between brothers and sisters from the same spawnings. Those fish which are likely to grow outstanding hoods begin to show signs of development even in their first year. This development will continue throughout the life of the fish, but most will be about four years old before their true beauty has been realised.

Marine Skimmers, valves, water and fish

I will shortly be setting up a marine tank and would like to know the following:

(i) Do I need a protein-skimmer?

(ii) Are anti-siphon one-way air valves necessary?

(iii) How much and how often should I do partial water changes?

(iv) Please can you suggest some good beginner's fish for me?

(i) PROTEIN-SKIMMERS — whilst a protein skimmer is not essential it can certainly reduce the frequency of partial water changes.

(ii) ONE-WAY AIR VALVES — are a "must". This is especially true where airpumps are mounted below water-level.

(iii) PARTIAL WATER CHANGES — this is a difficult one to give a firm answer to, due to the enormous number of variable parameters involved, all of which determine the rate at which captive seawater deteriorates in quality. I personally regard the two most important determinants to be:

pH — once you reach the stage where you are having to use "SEABUFF" pH powder more than once a week to keep the pH at 8.3, then it is time for a 25% partial change.

NITRATES — once the nitrate content of the seawater exceeds 50 ppm (hardy species) or 20 ppm (delicate species) then it is time for a 25% water change. Please note that, due to the incredibly high level of nitrate in many water boards' tapwater these days, you may have to use de-ionised tapwater or clean rainwater to make up the seawater originally if you are to avoid having a nitrate reading of 20 ppm to begin with.

(iv) BEGINNER'S FISHES — any Damselfish, the Teak Clownfish, and Grouper or

Trigger species (provided you avoid small and/or shy fishes as tankmates), the Chequered Angelfish (*Holocentrus xanthurus*), the Sunburst Butterfly (*Chaetodon kleinii*), the Moon Wrasse (*T. lunare*) and so on. However, please keep just two Damselfishes only (different species, please) for at least a month after maturing the filter.

Basic needs

I am planning to establish a 48in x 12in x 15in tropical marine aquarium. The equipment I intend to use is as follows:-

- (i) a reverse-flow undergravel filtration system powered by an external powerfilter;
- (ii) additional aeration by means of two long wooden diffusers;
- (iii) two 36in 30 watt Northlight tubes;
- (iv) two 150 watt combined heater thermostat;
- (v) my synthetic seawater will have a density of 1.020 at 76°F;
- (vi) I will mature the filter system using *Seamaster* until nitrates are 0 ppm and nitrites are less than 20 ppm. Your comments would be most welcome.

Your filtration scheme is ideal and almost certainly couldn't be bettered, no matter how much money you are prepared to spend. I would suggest, though, that you should add some ultra-high activity marine charcoal to the power-filter. Additionally, whilst your lighting is adequate for a fish-only tank, you would have to add one more Northlight and one Gro-lux tube (36in) if you hope successfully to keep invertebrates and the larger algae. Your other suggestions are fine.

Tropical

Shovel-noses and Arowanas

I have been lucky enough to purchase a 7ft x 18in x 18in tank. What wattage of heater would I need? I have a Diatom filter which would keep the water clean. The fish I have at the moment are Shovel-nosed cats; seven of them. They are about 6 inches long. Will Arowanas mix with my Shovel-noses? Could you advise me on how to feed these attractive fish and how many

could I keep in a tank this size? Could you also suggest some strong plants for my tank?

I would recommend two heaters for a 7 foot tank — one at each end (two by 300 watts will maintain 70° to 80°F).

Your Diatom filter is only for "polishing" the water — to maintain a constant filtered state use a large power filter or powered undergravel.

The Shovel-nose Cat could be *Sorubim lima* or some other

related species, such as *Sorubimichthys planiceps*. Both of these are from South America and both are nocturnal predators. They are lazy, slow-moving fish which come out to feed after dark, so you will not find them very attractive in your big tank. Yes, they will mix with Arowanas — in fact any fish too large to be swallowed.

Your large tank will hold the usual numbers of fish based on surface area — the body lengths

in inches will be the surface area (in inches) divided by 20 (for larger fish). The depth has no effect on stocking levels.

18in should also prove acceptable for all the usual aquarium plants. Sword Plants (*Echinodorus*) look good in deep tanks. Use Water Wisteria (*Hygrophila difformis*) for quick, strong growth.

Food for Archers and Puffers

Could you advise on suitable diets for the Archer fish and Puffers which I keep in my brackish water aquarium?

The Archer fish accepts all surface food. Try flake food, freeze-dried foods and live foods such as White Worm, Grindal Worms, Micro Worms etc. Catch and remove foods that sink below their normal feeding area at the surface.

Puffers prefer snails as food and a separate tank could be set up to raise unlimited supplies. Use reject aquatic plants, even lettuce leaves, for a colony of Ramshorn Snails *Planorbis cornus* or any of the many tropical snails from any Aquarium shop.

Plants Types of Bogwood

I have seen adverts in A & P for various types of bogwood. Can you explain the difference between them before I send away for some for my cichlid tank?

Bogwood comes from various parts of the world. It is wood which has been preserved as a result of being pickled in highly acid, boggy conditions. Some pieces may, in fact, be hundreds of years old.

English or Cornish bogwood is formed from oak roots which have lain in peat bogs. This wood tends to be in chunky pieces, ideal for use as accent pieces. Malayan bogwood is darker in colour and is mostly long root pieces. Brazilian wood is very heavy, almost black in colour and comes in many configurations. Bogwood, in general, is well-suited for use in tanks housing fish and plant species which prefer soft, acid conditions.

JOHN ALLAN AQUARIUMS COMPETITION FINAL WINNERS

1. Part 2 Winner

The lucky winner of the £100 Eheim 2113 Thermofilter offered in Part 2 of our competition in October is Mr. A. Heslop, 9 Lamont Way, Knightsbridge, Livingston, EH54 8HL. Congratulations go to the winner who will shortly be receiving his prize direct from our sponsors.

The correct answers for Part 2 were —

1. JEWEL 2. DELTA 3. EHEIM

2. Overall Competition Winner

The £330 Delta Aquarium and Cabinet offered as the overall prize for all those who answered Parts 1 and 2 correctly was won by Mrs. B. Williams of 1 Milton Close, Brixham, Devon, TQ5 9QY. This super prize will soon be on its way to you, Mrs Williams — it's a beauty! Happy Fishkeeping.

We would like to congratulate all our winners and thank the hundreds of A & P readers who entered the competition. Our sincere thanks also to John Allan Aquariums Ltd. for their generous sponsorship.

NEXT MONTH Coming up in January

Start the year right with A & P

- Win a £500 environmental aquarium system from Lahaina.
- Focus on Fish Health — special features.
- Dazzling Dwarfs — spectacular alternatives to their larger cousins, the tropical marine Angels.
- Keep your pond fish safe all winter — Edward Lea provides the golden rules.
- Regulars, competitions and much, much more make our January issue truly unmissable.

YOU CAN WIN ONE OF LAHAINA AQUARIUMS' UNIQUE NEW WATER MANAGEMENT SYSTEMS, worth £500.

It's a remarkable yet simple concept, developed over the last seven years by Chick Holland, to maintain optimum water quality in your tank with constant water movement and no loss of water level. The basic system is something like a river weir, but now Chick has developed a surf unit and even a tidal system to re-create ocean conditions. So it is not only beneficial — it adds to the aesthetic appeal of the aquarium too.

More details on the system next month, and all you need to know to enter the competition which could put your fish in aquatic luxury.

So don't miss the first Aquarist and Pondkeeper of 1987. It promises to be a great year!



Left: A typical example of spawning behaviour. The male makes his body undulate and folds his dorsal fin towards the female. Shortly afterwards the female moves to the side of the male and, pressed closely against each other, they are able to lie completely motionless on the spawning site for a long period of time. Right: A pair engaged in spawning. The male behind the female fertilises the eggs.

AN EASILY SPAWNED GOBY

Tateurdina ocellicauda is a colourful New Guinea goby which is easy to breed. Arend van den Nieuwenhuizen tells of his success at breeding this species and supplies his colour photographs

Not too long ago hobbyists were pleasantly surprised by the introduction of a very attractive species which at present goes under the name of *Tateurdina ocellicauda*. Since then it has become questionable whether this name is correct, but it has not yet been established what the correct name should be in its place. What is more important is the fact that it is very easy to breed, even if different aquarists report an extremely wide range of experiences. Some relate how the fish make use of the adhesive which seals the tank for spawning purposes while others report them spawning in sections of bamboo suspended vertically but refusing to do so if the bamboo was placed horizontally.

The hobbyist who reported the latter method of spawning also found the fish would not spawn in flowerpots or coconut shells. Others found, however, that flowerpots were readily made use of, spawning inside the pot or beneath half a flowerpot which had been pressed into the sand at the bottom of the tank. From this one might conclude that this species prefers confined spaces to spawn in. Funnily enough, however, the fish will spawn in a depression in the sand on occasions but this only occurs, as far as is known until now, when there is no confined space available and the fish have no choice. It is probably the case, therefore, that they prefer a place where it is dark or, at any rate, darker than the normal amount of light in the aquarium. I

found this to be the case when I placed a coconut shell and a piece of resinous wood in the aquarium for the fish. In the underside of the wood was a deep groove and this was chosen as the future spawning site as it was also surrounded by plants.

Difficulties in photographing

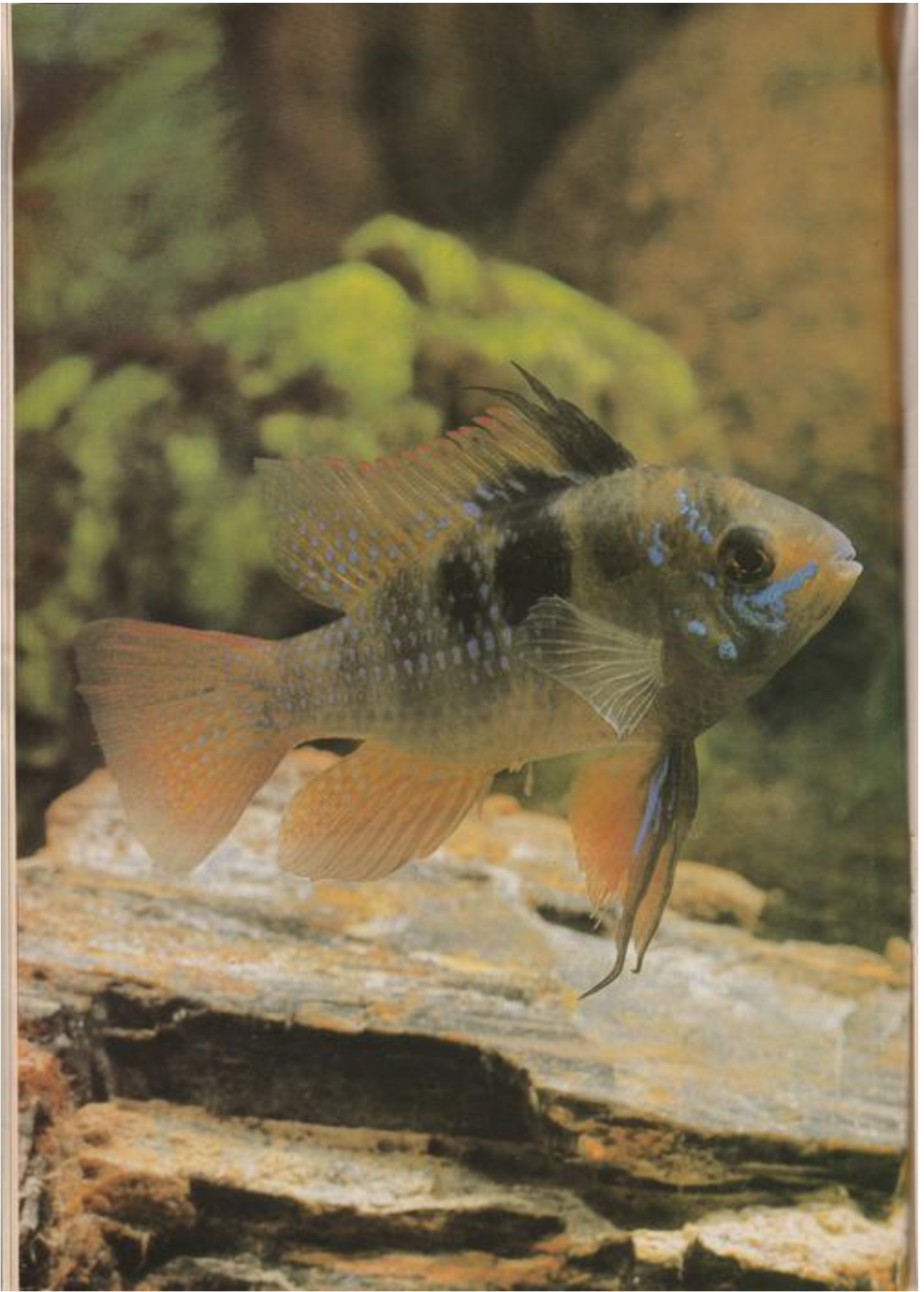
As this did not enable me to photograph the fish I turned the wood over. This exposed the groove in the wood to more light and the fish left it after a time and moved into the coconut shell. When I removed the latter and put the piece of wood back into its original position the groove was occupied again. Then I reduced the amount of light in the tank and carefully turned the wood over. The fish remained in position and spawned.

The courtship behaviour of this species is very restrained. When the female approached the groove the male often emerged with his fins folded back which he would then suddenly spread wide. Then the two fish usually circled each other in an open space between the plants before swimming towards the wood, the female following the male. Sometimes the female was the first at the prospective spawning site and then she would await the male with outspread fins. The male often made snake-like movements with his body before suddenly nibbling the female's side. During this time the female kept her fins extended and the fish moved to the left in the wood where they pressed

closely against each other and often stayed for more than half an hour positioned against the wood without moving. The spawning procedure is very gentle and if one does not observe closely there is a strong likelihood that it will not be noticed until the eggs are discovered. The eggs are not transparent but have a white centre, as is the case with *Brachygnathops muriei*. Their shape is different from the normal, as can be clearly seen in the photograph, and instead of at one end they are attached to the substrate by a number of thread-like appendages.

Male guards eggs

After spawning the female is driven away and the male guards and attends to the eggs. The number of eggs produced varies between 60 and 100. The young hatch at a temperature of 25°C after four days and are then 4 mm long. They have dark eyes and a large yolk-sac which is not absorbed until after seven or eight days. The now free-swimming young will immediately feed on freshly hatched brine-shrimp. It is very important that they are fed well and regularly from the very beginning. At the beginning the young are transparent, but after a week they are an attractive yellowish-green and after three or four weeks they are fully coloured and already 10 mm in size. The water hardness in the breeding tank was 5°DH. A partial water change was carried out every week.



THE RAM

Microgeophagus ramirezi (Myers and Harry 1948)
Roman Sznober sheds some light on the Ram, a favourite dwarf cichlid with a confusing past. Photograph: Bill Tomey

Since its introduction into the hobby nearly forty years ago, the "Ram" has become one of the most popular dwarf cichlids, yet it is still somewhat of an enigma.

Originally described as an *Apistogramma* species, it has a confusing taxonomic history and its position remains to be resolved. That the Ram differed from the other species of *Apistogramma* was noticed by several authors who proposed alternative generic placings for it — most recently *Papiliochromis*, proposed by Kullander in 1977. Now, however, following an extensive search of the literature, one of the former generic placements, *Microgeophagus*, has been given priority over *Papiliochromis*. The name in this instance is attributable to Axelrod, who published sufficient information to constitute a valid description as a passage in one of his books, although he (erroneously) cited Wickler as the original author of the name. Axelrod's article was regarded as a popular account rather than a formal proposal and remained obscure until recently.

Unlike *Apistogrammas*, which tend to be strongly dimorphic, the sexes closely resemble each other in body shape and coloration. Male *ramirezi* have longer ventral fins and the second and third spines of the dorsal fin are greatly extended; females have only moderate fin extensions and the soft portions of the dorsal and anal fins are rounded. When mature, the females develop a delicate pink to mauve colour on the abdomen.

Colours, size and distribution

Wild specimens typically grow to 45mm; aquarium specimens often grow to 55mm or larger. The body is relatively deep compared to the length and gives the fishes an ovoid shape.

The colours of the Ram are truly exquisite. The head and chest are yellow, and the body electric blue throughout. There are six dark vertical bars on the upper half of the body, the second of which extends to form a conspicuous black spot midway along the back. A curved black stripe runs down from

the nape of the neck to the throat. The vertical fins are yellow bordered with red and the soft portions are covered with iridescent blue spots. The eyes and ventral fin rays are red. The elongate spines of the dorsal and ventral fins are black. As in other South American dwarf cichlids there are two thin turquoise stripes running from the nose to the gill cover.

The natural distribution of the species covers the Orinoco basin savannah areas in Colombia and the Venezuelan Llanos. Rams are found in small pools and streams that have a muddy bottom, clear water and rich, submerged vegetation. The shallow and exposed nature of these habitats means that the temperature ranges from 25° to 37°C over a 24 hour period. The water in the lagoons tends to be more acidic than in the streams, around pH 5.1, with a high organic content giving it a colour like that of weak tea.

Maintenance and breeding

The species should therefore be given a shallow yet spacious tank, with fine gravel and dense stands of plants; good illumination and peat filtration are recommended. With regard to water quality, wild-caught specimens are extremely fussy and require soft water with a total hardness of 3° or less and devoid of nitrites. Their tank-bred counterparts are much more tolerant and can be kept in harder water with a higher pH value. Both benefit from weekly water changes of approximately 25%. Water temperature need not be as high as in the natural habitat; 24°-25°C is sufficient.

They prefer live foods such as *Daphnia*, *Tubifex* and bloodworms but will also take a good quality flake, suitably crushed.

The Ram is a peaceful and retiring species that likes the company of small fishes, and can be kept in small groups or in pairs.

For breeding, pairs should be allowed to form naturally from within a group and then removed to a breeding tank. This should be set up as above but with the addition of some flat stones and a temperature raised to 28°C. With good feeding and the minimum of disturbance the pair should

spawn within a few days. Their courtship is a delight to behold. The pair flutter head to tail, in circles around the tank, with fins erect, and pectorals and tails beating vigorously. Both partners will clean a selected site prior to spawning. The eggs, about 150, will hatch within 48 hours and the fry need to be fed brine shrimp nauplii when they become free swimming. Young Rams require chopped live food and clean conditions, but even so, tend to be slow growing.

New strain

Lately, Singapore breeders have produced a strain known as the Asiatic Ram, larger than the true *ramirezi* with black markings extending into the dorsal fin and a conspicuous blotch between the eyes. It must not be confused with *M. altipinna*, the 'Bolivian Ram'. This cichlid was previously thought to be a *Crenicoma* species described by Haseman, until Kullander established that its relationships lay more with *Microgeophagus*. *M. altipinna* grows in excess of 60mm SL (Standard Life) and has seven vertical bars (instead of six) and dark blotches on the operculae and lower caudal. Coloration is similar to that of the Ram. The occurrence of this second species is an interesting zoogeographical problem. Yet another enigma.

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News from the societies

Information Sheets from Kirkcaldy Aquarist Society

In July 1985 the KAS Committee decided to launch a series of information sheets with the main objective of "making available... the personal experiences of those club members who are keeping and breeding rare or unusual fishes."

The result, as the illustration shows, is a rather attractive well-set-out series of cards on individual species. There are four categories of information sheets: yellow (catfish), pink (livebearers), blue (cichlids) and green (all other species). Each sheet (which is punched for insertion in a ring folder) carries the common and scientific name of the species concerned, its country of origin, overall size and details of biology and aquarium care.

It is hoped that the sheets will soon be available embossed with the club logo. Distribution is largely through the society's Newsletter "KAS News" issued eight times a year (two sheets per Newsletter). However, complete sets can also be

bought independently. For details of the price (recently under review), as well as further information on Kirkcaldy Aquarist Society, contact W. Toft, 11 Striven Place, Rimbleton, Glenrothes, Fife, Scotland, KY6 2ET.

Dunfermline & District A.S.

On Sunday, the 14th of September, the Nethertown Institute became the centre of the Scottish Aquarium scene, when the Dunfermline & District Aquarist Society held their annual Open Show, and played host to fishkeepers from all over Scotland, also attracting 11 exhibitors over the border from Workington in Cumbria.

Dunfermline members were well represented among the prize winners, collecting 10 of the 24 trophies, including two of the three major awards. The most successful exhibitor was John Wells, and the most successful society was Dunfermline. The other major trophy, which was for 'Best Fish in Show' will spend the next 12 months in England as a just reward for the excellent standards of the Workington &



District Aquarist Society.

While the exhibits were being judged, the exhibitors and the public were entertained by an auction of fish, aquarium plants, and fish food. A tombola and a raffle were also held. The 1st



prize, a complete aquarium set-up, was donated by Aqua Nova of Kirkcaldy, and the 2nd prize, a snooker table, was given by Renton Transport. The Society would like to express their thanks for all donations.

Invitation From Malta

Randolph Bartoli, the secretary of the only tropical fish club in Malta (Ghaqda Tat — Trobbija Tal — Hut, 1970) would be pleased to establish contact with aquatic societies in the UK. He also offers an open invitation to any aquarists visiting Malta during September-October to drop in at the society's week-long show which

takes place in Valletta. We are delighted to publicise the society's existence and activities, and hope that this will lead to contact between clubs in the UK and their Maltese equivalent (which is an Associate Member of the F.B.A.S.).

Write to Randolph Bartoli (Hon. Sec.), A.S.T., Tigné, Sliema, Malta.

OUT AND ABOUT

with John Dawes

Marines and a lot more besides at Riverside Aquatics in Cardiff

If you are down Cardiff way, why not stop off at Kerrison/Riverside Aquatics? Better still, why not make a special trip? Hundreds of people did just that on 26 October when K.R.A. held its first Open Day.

Some guests travelled hundreds of miles — and they weren't disappointed (the fact that wine and food were plentiful had, of course, nothing to

do with this!).

K.R.A. now has a new and expanded Tropical Marine Centre filtration/treatment system (installed in summer 1985) which makes it possible to display 30 times more marine fishes and invertebrates than previously. As a result, Riverside Aquatics now has the largest marine department in all Wales — around 32 tanks holding 2,700 gallons of seawater.

The freshwater section has also been expanded and now caters for hobbyists' needs much more comprehensively than before. At any one time, for example, you will find several varieties of Discus in

differing sizes, a selection of African Rift Lake Cichlids and some of the more desirable cats, e.g. *Synodontis angelicus* — as well as a host of bread-and-butter species, of course.

In the dry goods department, almost every fish food which is currently on the market is available, from flaked foods to deep-frozen ones (displayed in a glass-fronted freezer). Also on display is a whole range of equipment, from full Tunze Systems down to a single T-piece.

Besides aquatics, K.R.A.'s 4700 sq. ft. premises also house a busy pet section selling reptiles, birds and small mammals.

Eight members of staff are constantly on hand to give advice on all aspects of pet keeping.

Kerrison/Riverside Aquatics is open seven days a week:

Mondays	
Tuesdays and Saturdays	9.00am - 5.30pm
Wednesdays and Thursdays	9.00am - 6.30pm
Fridays	9.00am - 8.00pm
Sundays	11.00am - 4.00pm

For further details, contact Melvyn John at Kerrison Animal Health/Riverside Aquatics, 1A Leckwith Road, Canton, Cardiff, CF1 8AU. Tel: (0222) 394733.



View of the lily bed in summer — the winter 'cave' is underneath.

THE ICE MAN COMETH

This month's thorny subject is the vexed question of caring for Koi through the vagaries of our British Winter. It grieves me to have to say "vexed", because in my book this statement is unnecessary.

Provided their keepers have done their stuff as regards proper accommodation and water quality, there is absolutely no reason or excuse for Koi not being able to sail through the winter, re-emerging in spring in all their glory.

Unfortunately, it is a fact that each year, Koi keepers, even those of many years' experience and well respected in Koi keeping circles, sadly announce the loss of their favourite Koi or even several, and go on to justify their loss by blaming the winter. Personally, without wishing to offend anyone, I say the blame lies elsewhere.

Koi are Carply! And carp are not tropical fish! Admittedly they sink into a state of torpor or semi-hibernation when temperatures fall to 10°C and below, bodily activity reducing to the point at which the only sign of life is gill movement and the occasional foray to have a look around their home.

The secrets of successful overwintering

What then, are the secrets of successful winter Koi keeping? First and foremost

Winter need not be a danger period for Koi as **John Cuvelier** demonstrates with his simple recipe for successful overwintering. (Photographs by the author).

must be sufficient depth of water to minimise temperature fluctuations. At a depth of 5 feet, these are insignificant. Of equal importance is the maintenance of good water quality. Do **NOT** switch off your filtration system as many keepers do. This is a cardinal error and one which has been solely designed to increase my blood pressure each time I'm told about it!

Even in hibernation, Koi breathe, and their digestive systems continue operating at a reduced rate, both of these functions resulting in the egress of water pollutants. Apart from the very coldest of days, Koi will continue to nibble blanket weed or the coating of algae on the pond wall. In fact, I'll set the cat among the pigeons by announcing that my own Koi **CONTINUE GROWING THROUGHOUT THE WINTER!**

If you have a venturi (aeration attachment)

on the outlet of your pump, keep it going but do turn it through 180 degrees to ensure that cold air is not being injected into the pool. The current thus generated will prevent the pool from freezing over, though this tip is only applicable when the pool is large enough to ensure that your Koi do not have to expend energy in swimming against the current.

Which brings me nicely to the next requirement, shelter. This is where these clinical pools beloved by the Koi collectors fall down. The one thing which Koi love in both summer AND winter, is somewhere private where they can all huddle together discussing the weather! My own pool has a cave constructed under the lily bed, the volume of which is about one cubic metre, into which something like a hundred fish congregate like sardines in a can, if you pardon the expression!

You might well throw up your hands in horror at the thought of all those fish jammed into such small space for such a long time, but I kid you not, we have not lost a single fish in three winter seasons!!! As stated previously, they do sally forth to have a look around and, strangely enough, they are most active during the hours of darkness.

Winter in the part of the country I live in can be quite hairy at times because, although snow is a rare visitor, the frosts are something

else, being extremely severe and long running. Despite this, the only surrender I make to Jack Frost is a 100-watt Lotus Pond Heater strategically positioned in the lily bed, as owing to its horseshoe shape, it could be at risk through ice.

The 40 yards of stream, filters and cascades have no protection whatever and have never iced up however severe the weather. Do remember also, that no matter how cold the weather might be, there is always bacterial activity in the filters, albeit drastically reduced, but enough to cater for the reduced output of fish waste.

A considerable number of Koi keepers place their fish in winter quarters for the duration, utilising the garage or garden shed and spending large sums of money and much energy in providing tankage, filtration etc. — in my opinion a waste of resources. Far better surely, to let them spend the winter in their natural habitat than suffer the stress of moving and so-so water conditions.

Even a featureless formal pool can be equipped with a winter shelter. I've heard of plastic dustbins being weighted to rest on the pool floor, or short lengths of concrete pipe, though these can only be considered as second best alternatives. Some people merely float an 8 x 4 sheet of 4 inch thick polystyrene on the pool surface, covering perhaps half the surface area. Whatever you do, it has to be an improvement.

Pool maintenance

Winter pool maintenance, of course, MUST continue. Removal of the inevitable



Above left. Venturi in summer mode — air is drawn down and pumped into the pool.

Above right. Venturi rotated through 180° for winter operation — water current is produced, but no cold air. *NOTE* The pipework has been raised above water level in both top photographs to show the different arrangements. In normal use, everything would be underwater during winter.



Left. Venturi in operation in summer.

detritus which gathers all year round, regular removal of "dead" water from the deeper part of the pool — just a quick burst from the bottom drain if fitted will do the trick. If you can arrange it, have a small amount of mains water running continuously; it works wonders! In the autumn, of course, remove all dead leaves BEFORE they sink to the bottom. Okay, so it's a chore, but these creatures are in your care and the least

they deserve is the best you can give them.

All the foregoing assumes that the normal end of season activities have taken place, like the removal of dead plants etc., treatment of any "poorly" fish, cleaning of pumps etc. If you have been a good Koi keeper, your Koi will reward you in their usual spectacular manner.

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PRODUCT ROUND-UP By Dick Mills TWELVE BOOKS FOR CHRISTMAS

SPECIAL ANNOUNCEMENT

As from this month Product Round-up will be in the very capable hands of Dick Mills — internationally known author, highly respected ambassador of our hobby and regular contributor to *A & P*. Dick is taking over from Ian Sellick who has been forced to give up his regular contributions owing to an ever-expanding and increasingly heavy work schedule. We thank Ian most sincerely for the tremendous work he has done for us in the past and look forward to receiving occasional and valued contributions from him in the future. At the same time, we extend a very warm welcome to Dick whose expert opinion and well-informed comments will undoubtedly provide a top-quality service to our readers.

Faced with the task of selecting the best of books, it is difficult to know what yardsticks to use. What for me may be the absolute tops may well be the next person's all-time 'lead balloon' and some titles might be ignored by us both! In the end, I decided that there just had to be awards for the most visually appealing, the most consistent in quality, the standard work, the specialist work, the out-of-the-ordinary and, finally, the blockbuster of the year.

The Water Garden by Anthony Paul and Yvonne Rees (Windward/Frances Lincoln Ltd — £9.95) is one of those books whose contents most of us can only dream about, never having either the space or the funds to achieve them. However, it does provide intense pleasure in reading and wallowing in the superb photographs of equally superb and imaginatively-designed water gardens. If you can accept the sound principles of the book and put them into scaled-down practice then you will have the best of both worlds, for the book includes all you need to know about the design and maintenance of water-gardening.

Book production these days is highly-competitive with readers seeking not only the best in quality but also the best value for money. It will come as no surprise to you, therefore, to learn that the consistency award goes to Salamander Books for their continuing output in the **Fishkeeper's Guide** series (£4.95 each).

Without taking up too much valuable space, mention must be made of the 1986 releases: **Central America Cichlids** by David Sands, **Aquarium Plants** by Barry James, **Fish breeding** by Dr Chris Andrews and, a last minute entry, **African and Asian Catfish** by David Sands. All these offer the reader concise information on a particular aquatic subject and are so competitively priced that the fishkeeper can build up his/her own library of guides according to personal tastes and aquatic requirements.

It is probably true to say that Salamander Books now represent the norm against which other books are judged, such is the consistency of their quality.

Competition for the best standard work was hot and, to avoid being accused of partiality, I can do no better than announce a triple tie:

The Tropical Freshwater Aquarium by John Dawes (Hamlyn — £6.95), **The Aquarium Survival Manual** by Brian Ward (Macdonald — £11.95) and **You and**

Your Aquarium by Dick Mills (Dorling Kindersley — £9.95).

All offer sound all-round advice, production quality being about equal. The last two titles include tropical marines, and the last one features coldwater species from both freshwater and marine habitats. Whatever your needs there is a book for you within this group.

Contrary to popular belief, not everyone is a Cichlid-fancier, but **The Cichlid Aquarium** by Dr Paul V. Loiselle (Tetra — £12.50) could well be responsible for mass conversion. With nearly 300 pages of Cichlid lore, totally absorbing text and excellent photos, you read this at your peril. It is extremely good value for money and it will never be in your club's library for very long.

Everyone has their nice side and **Sharks of the World** by Rodney Steel (Blandford Press — £10.95) does much to redress the bad Press that these fishes attract. This comprehensive, out of the ordinary, work describes a multitude of species ranging from 6 inches to 40ft in size. It details their natural living patterns and reveals some beneficial shark properties — valuable skins, liver oils and even some real hope of new medicinal cures. Although the book may not make you like 'Jaws' any better (they do have almost a fatal fascination for most people) you will understand them better!

The blockbuster award goes, as might be expected, to Dr Herbert Axelrod's **Atlas of Freshwater Aquarium Fishes** (1th) — £50.00. Competition for this award was almost non-existent, although more than an honourable mention must be made of **Australian Freshwater Fishes** by John R. Merrick and Gunter E. Schmida (School of Biological Sciences, Macquarie University, Sydney — price around £25-£30). The former work, now in a second edition, is a massive pictorial collection of fishes; textual information is, of necessity, somewhat sparse in what is basically an identification parade of aquarium fishes. The Australian book is just as impressive; after all, most aquarists would have a hard time thinking up many fishes native to Oz, and this work will open your eyes to the wonder of fishes Down Under. Unfortunately, the odds on us seeing some of the fish is about the same as most of us saving up the airfare to see them in their native habitat!

Happy reading.

Mystery Tour of the Month

Circumnavigate the M25 to junction 4 and leave motorway by A21 spur. At the first roundabout, leave by first exit. At second roundabout (Badgers Mount) leave by second exit. After about 300yds, turn left onto concrete drive into a huge car park.

Weather permitting you may spot a 20ft Koinobori proudly flying. You will certainly notice some strange red oriental hieroglyphics, but what you will find inside to delight you, nobody knows.

Certainly, a limited number of 8in/10in Japanese koi in several varieties that have grown on in Kent and are offered at less than air freight costs from Japan! Probably Koi Kalenders for '87 along with other Christmas goodies. But just what beautiful koi Glyn and Bill will find in Japan will remain a mystery until their return. They will not disappoint you.
**COME SOLVE THE MYSTERY
LATE NOVEMBER ONWARDS**



Top, Striped Fire Salamander, *S.s. terrestris*. (Photograph: Pat Wisniewski).

Above left, Spotted Fire Salamander, *S.s. salamadra*. (Photo: John Dawes).

Above right, Salamander female giving birth — note the submerged lower half of the body. (Photograph: John Dawes).

THE FIRE SALAMANDER IN LEGEND AND IN CAPTIVITY

To quote from that most learned of tomes, the Oxford English Dictionary, the salamander is an "elemental spirit living in fire" or, on a more sober note, "a tailed amphibian of the order Caudata." It is, incidentally, also the name given to a red-hot iron for firing gunpowder and a hot plate for browning the tops of puddings!

The words "fire" and "salamander" have long been conjoined for this was the animal, according to early bestiaries, that could live and, indeed, draw its energy from fire, that could douse an inferno and that could be carried as a charm against lightning. So taken with this animal's supposed powers were these latterday naturalists that they even believed asbestos to be the wool of a

Pat Wisniewski of the Amphibian Breeding Centre, reveals the secrets of the beautiful Fire Salamander and explodes some long-held myths in the process.

salamander, yet a less furred quadruped one could hardly wish to meet. Perhaps their off-the-mark observations can be blamed on a lack of National Health spectacles, a generous helping of blarney and a penchant for hearsay. Some writers even produced weighty dissertations on the behaviour of salamanders when tossed onto the fire, maintaining that the hapless creature survived several hours of roasting and lived for some time after its unfortunate experience.

The traditional explanation for this extraordinary belief is that the salamander, being a secretive soul, was prone to crawling inside wood-piles and faggots and was thus transported to the hearth. Disturbed by the heat, the salamander would appear, Phoenix-like, out of the faggots when these were



Fire Salamander "tadpole" (Photograph: John Dawes).

placed on the fire, giving the impression of an animal born of the flames. How curious that such a cold-blooded beast, ill-adapted to excessive heat, should be endowed with such pyromaniacal qualities. Yet such beliefs persisted across the European range of the species until the eighteenth century. In Britain the salamander was known only as a zoological curiosity imported from the Continent, for this slow-moving amphibian was beaten by the sea when our link with mainland Europe was severed after the last Ice Age.

Types of Fire Salamander

As the Fire Salamander (*Salamandra atra*) recolonised Europe from its southern refugia, following the retreating glaciers, it formed several subspecies distinguished by colour, shape of markings, size and body form. Today, eleven races are recognised from Europe, the Middle East and North Africa where it is mostly a lowland animal rarely reaching altitudes above 1600m. In more mountainous areas it is replaced by the similar, but all black, Alpine Salamander (*Salamandra atra*).

Fire Salamanders are large amphibians, on average about 15cm in length but known to reach 30cm in southern Europe. The usual coloration of the species is a pleasing ground colour of dark brown to black, blotched or striped with yellow, but colour is very variable and, in certain subspecies, the yellow is commonly replaced by orange or brick red. Totally yellow or totally black individuals do occur and occasionally the ground coloration takes on a purplish hue.

There is a subspecies *albanensis* which is unusual in that it is very aquatic and like the Axolotl (*Ambystoma mexicanum*) retains the characteristics of a juvenile and develops a showy coloration while retaining a flattened tail for swimming (neoteny). It is found in a few montane lakes in central Spain and is considered to be one of Europe's threatened animals. The most commonly imported subspecies is the Spotted Fire Salamander, *S.s. salamandra*, from central and eastern Europe and the Striped Fire Salamander,

S.s. terrestris, from western Europe, in which the spots are extended to form short stripes, occasionally joining up to give a humbug appearance.

Warning colours

The brilliant colour of the skin is often cited as an example of warning coloration, though it has to be said that in the dappled shade of a woodland, it serves as very effective camouflage.

Nevertheless, the animal may have use of warning coloration for its skin is indisputably poisonous, though not as poisonous as Pliny would have it when he wrote that this "wicked" animal could kill whole tribes unawares and even poison the fruit of a tree beneath which it sheltered. Once again our forebears' capacity for exaggeration has to be marvelled at for it was believed that if a salamander bit it never let go, and that its vomit caused instant blindness!

I have kept salamanders now for ten or so years, which may explain my own semi-baldness. I have however, yet to be bitten by one. They are charming creatures, requiring little maintenance and living long and interesting lives. I still have some of my original stock, which continue to breed and, according to the text-books, will live twenty-five years or more. Surprisingly, I have yet to see them emit any milky white poison from the very obvious glands behind the eye, though I have no doubt that they would do so if I attempted to eat them. The poison is meant to have an irritative effect on the eyes, mouth linings and cuts in the skin of an aggressor.

The ideal vivarium

The Fire Salamander is a denizen of cool, shady, damp places, especially deciduous woods with plenty of leaf litter and, this should be borne in mind when designing a vivarium for the species. Too often, I have witnessed salamanders housed inadequately in tanks of wet mud. Likewise, elaborate lighting or heating systems should be dis-

pensed with for the Fire Salamander is a temperate, nocturnal or crepuscular (twilight) animal with no desire to sunbathe. Moreover, it is terrestrial in its habits and only repairs to water, briefly, to deposit its young during the breeding season and, therefore, has no need of a large pool area in its tank.

Ideally, then, a full grown pair of salamanders may be housed in a 60 x 30 x 30cm tank on a substrate of slightly damp peat (keep it damp with a plant mister) and with a close fitting glass lid. The latter will retain humidity but should also prevent escape since even the heavy and cumbersome salamander is capable of inching its way up the corner of a glass tank if it feels so inclined. The most important feature of the vivarium should be provision of ample hiding places in the form of cork bark, sloping slates or tiles and half flowerpots. This inevitably means that the animals are less visible but allows them to lead more natural lives.

It is, however, better to avoid the temptation to create an over-elaborate tank since these are difficult to clean. If you must have plants then choose something which will thrive in poor light conditions such as ferns, mosses, *Helxine*, Peace Lily or even, at a pinch, the Spider Plant.

Breeding salamanders in captivity

If the animals are to breed then some water must be available, though a sandwich box or margarine container with a gravel bottom is quite adequate. The depth of the water, which should be well matured by letting it stand for twenty-four hours to remove chlorine, must not exceed about 4cm since salamanders are pretty clueless when it comes to swimming and easily drown. A rock protruding from the pool is a useful life-belt for a salamander out of its depth and treading water.

Sex in the salamander tank is a violent business and seems to occur at any time of the year, but can sometimes be induced by cleaning out the tank or giving it a spray. Males can be distinguished (with difficulty) by their daintier, slimmer appearance. Their cloaca (genital aperture) is a little more protuberant but this is easy to see only when the animals are ready to mate. Mating resembles a homicidal game of tag, the male pursuing the female relentlessly, biting and grappling with her and finally hooking his forelegs over hers and getting her into an amphibian version of a pin-fall, whence a spermatophore is transferred between the two. So frenzied is their love-making that I have heard of many a faint-hearted, inexperienced herpetologist who separated the salamanders at this point for fear of damage.

Gestation takes several months, the female eventually retiring to water where she submerges the lower half of her body and squirts out numerous free-swimming young. These resemble newt larvae and are generally a dull colour, about 2.5cm long with four legs and a pair of feathery gills. As many as seventy-five may be produced by one female. In the wild, many will perish, eaten by fish,

newts, snakes, insects and birds. In captivity, it is possible to rear all the young, though any deformed individuals (which occur commonly) should be humanely destroyed. Interestingly, salamanders from mountain areas sometimes skip the aquatic, larval stage by producing comparatively large, terrestrial young. Perhaps this is an adaptation to a short breeding season or to prevent larvae from being swept downstream by raging upland torrents.

Rearing the young

Larvae should be reared separately as they have a nasty habit of removing brothers' or sisters' gills and legs. Small margarine containers are ideal rearing cells but care should be taken to prevent the youngsters overheating or the water becoming foul or deoxygenated (a common problem if *Tubifex* is fed). They can be fed *Daphnia* but growth is generally poor. Much better is a diet of chopped earthworm or beef heart proffered by forceps to each larva in turn (be careful not to give very large food morsels as greedy youngsters sometimes choke). Hand-feeding, though tedious, allows you to check the health of each individual daily.

Metamorphosis (the change from the juvenile to the adult form), which occurs after three months and which should not be hurried along by heating the tank, is a sticky time, with the youngsters seeming at their lowest ebb and often refusing food. Highest mortality can be expected during this stage. At this time it is useful to provide

“Larvae should be reared separately as they have a nasty habit of removing brothers' or sisters' gills and legs”

a pad of moss or a stone onto which the metamorphosed young salamander can emerge. The water level should also be reduced or the juvenile may drown. Once it has metamorphosed and developed its bright colours, the youngster can be transferred to a miniature version of its parent's accommodation.

The adult diet

Adult salamanders feed on a variety of small invertebrates such as worms, slugs and slow-moving insects, caught either by grabbing with the jaws or flicking out the

tongue. In the vivarium mealworms can also be given, provided these are enriched with a good vitamin/mineral supplement such as SA 37 or Vionate. Maggots should be avoided at all costs as these are virtually indigestible.

Hibernation and aestivation

In northern and central Europe the Fire Salamander spends the winter in hibernation whilst in the southern parts of its range it is more likely to escape the heat of summer by aestivating. My own animals undergo a period of voluntary starvation during hot summers but never hibernate, though the temperature in their tank has dropped to 0°C. Some vivarium keepers become a little obsessive about hibernation and try to force everything into winter somnolence but it really is not necessary. Unlike some newt species, salamanders are quite capable of breeding without a short, sharp, cold shock. If you must insist on hibernating your salamanders (I suppose it saves on food bills) then a well-ventilated plastic box filled with damp foam rubber chips or moss and placed in a cold, frost-proof room or a refrigerator at 4°C should suffice, but remember that southern animals may never experience conditions of prolonged cold in the wild.

So there we have it, the refrigerated Fire Salamander, a far cry from the flame-proof entity of superstition and mediaeval science, but in my opinion, just as exciting a beast and an ideal pet for the novice herpetologist.

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THE SIGN OF GOOD BOOKS

Naturalist's notebook by Eric Hardy

Historical background and the Merseyside Aquarium Society

In 1928, my friend, the late Fred Jefferies, founded the old Merseyside Aquarium Society in a back street in out-of-the-way Wallasey, primarily to establish a Brighton-style corporation aquarium by the sea at New Brighton, with himself installed curator. His notepaper president, Liverpool University's Professor of Marine Zoology, never attended a meeting. Local aldermen vice-presidents obtained an old back street conservatory for the society, but with no funds to install large tanks or tropicals, it was an amateurish, make-shift affair rigged up from small gift-tanks on old bedstead-stands when I was an official guest at the mayor's opening ceremony in 1932.

Public attendance flopped, the paid girl attendant was dismissed shortly afterwards and the aquarium abandoned when a new promenade was planned across the waterfront without any access to the aquarium.

Jefferies did 90% of the voluntary work and gave up so much time as to destroy his photographic business. When the new Merseyside Aquarist Society was formed in Liverpool after the war, he ignored an invitation to join. W. Wilkie's public New Palace tropical aquarium had a short postwar life among the promenade amusements. Its curator, I. T. Williams, started a Wallasey Aquarium Society, while a recent plan to convert nearby derelict Leasowe Lighthouse into a marine aquarium never got off the ground.

Meanwhile, Ron Brown has published an interesting 114-page illustrated history of Merseyside Aquarist Society's first 40 years, bringing back many memories of the longest lasting local aquarium society.

Mersey pollution

Though we no longer have "The Hoeties" collection of tro-



Scleropages formosus, the Asiatic Arowana, is just one of several species of fish which can only be imported with a scientific licence. (Photograph: John Dawes)

pical fish in the canal at St Helens, we still need better conservation of local waters. I was one of the invited delegates to the Minister of the Environment's day-long conference on Mersey pollution. The Mersey basin has the highest concentration of polluted rivers in the UK but, as I told the conference, I hadn't seen most of its political and official delegates around its rivers or we wouldn't have had the old cliché requested that the Mersey has no fish. It has. A thriving new mussel-bed on Egremont shore has attracted more plaice well over 2lb to feed on the spat, while at Hale numerous 10-spined sticklebacks (usually pond-fish) as well as the river's commoner 3-spined sort were a feature of June. Sprats, eels, flounders and dabs are regular river-fish. A well-stocked new rainbow trout water has also been developed at Hurleston Hall, Scarisbrick, growing fish over 6lb. More are to be released into the Leeds & Liverpool Canal near Halsall.

Chinese Grass Carp

Chinese Grass Carp are now well established on the British fish-list though still not included in most fish identity books.

Despite the much publicised but unsuccessful pioneer introduction to Cavendish Dock at Barrow in 1963, their popularity since introduced to Trawsfynydd in Wales has grown considerably. Some 300 young 3oz fish introduced to Birkenhead's weedy park lake have grown to as many pounds, while a Liverpool University botanist conducted a £35,743 grant-aided research project into the effects of stocking Grass Carp into aquatic eco-systems. Sonic tracking was used to find their grazing impact and fish-proof fences to divide waters into plots.

The Grass Carp stirs up silt from bottoms as it feeds, resulting in muddy waters, checking the usual plankton and natural foodchains. The USA considers it could become a worse menace to native fishlife than Common Carp, already a pest of their rivers. Britain introduces it only to enclosed waters as a precaution.

Trade restrictions

Except with a scientific licence from the Secretary of State, it is illegal to import or sell 17 endangered crocodilians including the Australian Estuarine or Saltwater Crocodile, American, African Slender-nosed, Orinoco, Morelet's,

Nile, Philippine, Cuban, Siamese, West African Dwarf, and Mugger or Marsh Crocodiles. Also Chinese Alligators, Spectacled, Broad-nosed, and Black Caimans and Indian and False Gharials. Likewise 3 Iguanas, 4 Monitors, 6 Boas, the Indian Python, Tuatara, 5 Turtles and the River Terrapin, 7 Sea-Turtles, 5 Tortoises, Chinese and Japanese Salamanders, Golden Frogs and 3 Toads. In addition 8 fishes including Drum-fish, Blue Walleye, Giant Catfish, Shortnosed Sturgeon, and the Asiatic Arowana (*Scleropages formosus*) and the Ikan Gemolek (*Probarbus jullieni*), fall into this category, the last two being included without warning in Axelrod's Atlas of Aquarium Fishes.

The full list of reptiles can be seen in the Wildlife & Countryside Act (HMSO). Our Sand-lizard, Smooth Snake, Natterjack Toad and Great Crested Newt may not be collected. Palmate and Smooth Newts, Slow-worms, Frogs and Common Toads and Adders may not be bought or sold.

A trader was recently fined £200 for offering Great Crested Newts for sale in England. Only some 100 colonies are known here with some 40,000 newts. The answer, I presume, is to get a licence to import from abroad.

Tomorrow's aquarist

Christmas Countdown

The above is a very over-worked title; open any magazine in December and you will probably find it attached to features on cookery, gift-buying, entertaining and so on. Nevertheless, we make no apology for using it again — Christmas is a very overworked time.

There is no checklist that can ensure that everything runs smoothly. Our aim with this 'countdown' is to prepare you should anything go wrong. Let's face it, Christmas is a time for relaxing, eating, watching your favourite film or playing games. You won't be adding to the biggest 'Birthday Party of the Year' spirit if you suddenly have to overhaul your community tank...

1 The big jobs

In the week leading up to Christmas, get the big jobs out of the way. Do all the water changes, cut back the plants if they need it and clean out all but undergravel filters. Clean the cover glasses and the tank front and check for free-floating heaters and stats. Replace the suckers on these if they're past their prime. While you are inspecting the heaters and stats, make sure there is no sign of moisture inside any of them. The glass-covered ones in particular give little notice of failure when the glass is cracked or has come loose. If you have no spare covers to reseal them, look out any extra heaters you have and replace the broken ones.

2 The spare tank

When doing the water changes, it might be a good idea to use the 'matured' water you have drawn off — and usually throw away — as a "base" in setting up a spare tank. Check, before you do this, that there is no sign of disease in any of your tanks. There shouldn't be! Leave the spare tank ticking over with just heating and aeration; don't furnish it with gravel or plants. Once you introduce plants, you need lighting, which isn't necessary... in this case. You'd be

surprised how much trouble this extra tank will save you. If one of your fish becomes ill or bullied, your 'hospital' tank is ready. If your fish decide to 'make whoopee' on Christmas Day, your 'breeding' tank is waiting for them, with only the quick addition of rock, flower-pot or plant. If the worst happens and one of your tanks springs a leak, you can transfer the fish to the spare tank, empty the original aquarium and get back to Trivial Pursuits, happy in the knowledge that your fish are settled and you don't have to reseal the offender till the New Year.

3 Food

On the subject of food, it's easiest to stick to flake and freeze-dried foods over the holiday. Tubs of *Tubifex* and nets

full of *Daphnia* might not go down too well with the more squeamish of your guests if you have your tanks in the living-room. Bear in mind, also, that fridges and freezers are filled to bursting point at this time of year and you may not, therefore have the usual space available for frozen foods, particularly the mince pies and assorted cheeses, not to mention the turkey!

4 Medicines and first aid kit

Check over your medicines. Even if you can't foresee any need for the broad-spectrum antibiotics, White Spot treatment should always be handy. If any of your fish are breeding, you will also want some Methylene Blue for the eggs and fry.

Lastly, make yourself a first aid kit. Put a box in a handy

place near the tanks. Into this, put all the spare equipment you can lay your hands on — heaters, thermostats, pump, starters for the lights, any tungsten or fluorescent tubes you have, nets and plastic bags. If you don't have a spare pump, you should have a spare diaphragm. Pumps often fail because the diaphragm is worn and it doesn't take a minute to change them over. Don't forget the most overlooked component of your aquarium — fuses. All your electrical equipment relies on these failsafe devices and yet so many aquarists don't give them a second thought. You might think that you have plenty to spare, but remember that lots of "spare" fuses (and plugs) are in use at Christmas — for the tree lights, electronic games and all those appliances that come, so infuriatingly, without a plug! So buy some more now — and hide them!

Beginner's Corner

"Keep The Flags Flying!"

"The first cichlid that I kept and tried to breed was the Flag Cichlid, *Aequidens curviceps*. It is one of my favourite cichlids, owing to its peaceful nature and stunning colours. My first pair appeared somewhat timid and I hardly saw them for the first few days. This was hardly surprising, however, as my room was being decorated at the time, with all of the furniture and tanks covered in newspapers.

During this time, I was becoming increasingly worried about my new charges. All the frantic pacing up and down turned out to be totally unnecessary, however, when I uncovered the tanks. I was greeted by the sight of two proud Flag parents, hovering around a clutch of about 150 eggs. Unfortunately, these soon fungussed and I was unable to save any fry.

Nevertheless, the pair spawned a fortnight later. Having prepared everything, I removed the spawning rock and placed



Aequidens curviceps, drawn by Andrew Grant.

it in another tank, to which I had previously added some Methylene Blue. I also installed an airstone beside the eggs, thus keeping a steady flow of water over them to avoid any fungus infections. Despite all of these precautions, none of the eggs survived.

There followed a period during which my interest in *Aequidens curviceps* "flagged", and my enthusiasm was only rekindled when I saw a beautiful pair some time later. Unfortunately, when put in the aquarium, one of them turned on its companion, so I separated them immediately.

On re-introducing the pair, the previously submissive fish lit up like a beacon and stretched its fins almost to bursting point. The fish circled each other in a waltz, which was interrupted by the dominant one which bit its rival's fins. When this had no effect, he held himself almost

vertically in the water. His fins and body were a bright, opalescent blue which, combined with the shimmering golden eyes and red mottling, was a stunning display. This seemed to intimidate the other fish, which went pale and folded its fins. At this, his adversary took a sizeable chunk out of the poor fish's tail!

There then ensued the most violent display of aggression I have ever seen in any fish, and certainly one of the most beautiful. The fish circled each other, spinning faster and faster so that they looked like a rainbow being sucked into a whirlpool which exploded into a fountain as they broke away from their battle.

Much as I regretted having to interrupt such a dazzling and exciting display, I had to save the fish from each other. The dominant one now parades around his tank with a certain aloofness, safe in the knowledge that his opponent isn't within nipping distance of his fins."

Andrew Grant

Andrew will shortly be receiving a Whisper 200 pump and a copy of 'A Fishkeeper's Guide to maintaining a healthy aquarium' by Dr Neville Carrington. Both items were generously donated by Interpet Ltd.



Above, an adult Emperor Angel, *Pomacanthus imperator*. In the wild, very large specimens tend to develop a dorsal filament and are invariably males. (Photograph: Martyn Haywood).

Below, a pair of Common Clownfish. The larger and stockier fish, seen in side view, is the female. (Photograph: Martyn Haywood).



Generations of fishkeepers have begun the hobby with a mixed "community" tank of the commoner freshwater tropical fishes. A fairly large proportion of them then expand their hobby to include breeding these and more difficult species. Only a comparatively small number then go on to keep marine tropicals, a venture which, personally, I consider little more difficult than maintaining most freshwater fishes.

The question why this should be so appears to have a simple answer in that "they don't breed".

This statement is so obviously fallacious, judging from the numbers of reported spawnings of tropical marines, that it cannot be taken seriously. While I am not claiming that marine fry can be easily reared, that is not to say that they will not spawn, given the right conditions.

It is not the purpose of this article to go into the problems and rewards of breeding marines. Many articles have appeared in the literature lately giving, admittedly guarded, reports of spawnings and rearing successes. It is, rather, to examine an earlier and vital step which has been given little coverage, that of selecting true male and female pairs of marine fishes.

The following guidelines are by no means definitive, and I have no doubt that aquarists reading this will have their own views on my suggestions. Rather, they are reports of apparent sexual dimorphism noted when fishes of the same species and approximate size have been kept together.

It seems generally accepted that the majority of commonly kept marines will fight when kept with their own kind unless they are pairs. It is from this very loose premise that I am working in several of the following cases.

CLOWNFISHES AND DAMSELS

Amphiprion percula/ocellaris (Common Clown). When these fish are over 2½ inches in body length they can be sexed with approximately 90% accuracy. In the male the central white band generally has a concave 'V' point which comes close to the first, anterior white band. In the female the band is usually less pointed and covers a smaller area. More importantly, the female is noticeably deeper in the body.

Amphiprion perideraion (Skunk Clown). When sexually mature, i.e. of a body length of 2 inches or more, the male invariably sports a thin orange edging to the otherwise clear caudal fin. This is never apparent on the female.

Amphiprion sebae (Ceylon Black and White Clown). When large i.e. over about 3 inch body length, approximately 50% of these fish sport a bright orange patch under the mouth, and extending into the pectoral fins. In these same specimens, the caudal peduncle is also orange-yellow. It is assumed these specimens are males. The "females" have black bodies with two broad white bands and solid yellow tails.

SEXING TROPICAL MARINE FISH

Contrary to many aquarists beliefs, it is possible to breed tropical marine fish in captivity. First of all, of course, you need to choose a true pair. Martyn Haywood of Reflections Aquatic Centre points the way.

Amphiprion clarki/xanthurus. (Chocolate or Brown and White Clown). This and *A. sebae* are among the clowns most intolerant of unacceptable members of their own species, the weaker fish frequently being hounded to death. This species is one of the most variable but, generally, the males have brighter and larger orange areas on the chest and belly. The more pointed pectoral fins and tail of the supposed males may also be diagnostic.

Amphiprion ephippium. (Tomato Clown). A large species reaching 5 inches plus. The best sexing guide in large specimens is body shape. The male is distinctly bull-headed or ovoid when seen in profile. Females are generally smaller but more importantly, are more elliptical.

Pomacentrus coeruleus. (Electric-blue Damselfish). This is one of the easiest marines to sex. Mature males have a blue tail. In females the tail is always clear. When spawning or courting, the male turns deep blue with paler blue blotches. My pair almost invariably spawn two days before the full moon even though they are in a room with blinds. Whether or not the phase of the moon is significant is open to conjecture.

ANGELFISHES

Centropyge bispinosus. (Coral Beauty). About half of the Coral Beauties exported from Philippines, when 3 inches longer or more, show a conspicuous orange flash along the belly. Although I have no first-hand experience of spawning these fish, when a specimen with the orange flash, presumed male, is placed with another having a deep blue belly they will normally prove compatible. If two of similar colouring are housed together they will generally fight.

Centropyge heraldi. (Philippine Lemonpeel). In this species apparent sexual dimorphism is minimal. However, if several specimens of good size are compared some specimens will be seen to have less rounded trailing edges to their dorsal fins than others. Again, two dissimilar specimens will often be found to be compatible.

Centropyge resplendens. (Atlantic Flameback Angel). This beautiful little angel has to be the odds-on favourite for home aquatics angelfish spawnings. These blue and orange fish from Ascension are as hardy as damselfishes and, like them, can be

kept in a group of five or six individuals. They appear to reach a maximum length of a little less than two inches and, when specimens of a similar size are kept, their sexes would appear ascertainable. The "males" are similar in body shape to *C. aurantostriatus*, being longer in the body than the noticeably more ovate "females".

Geniactanthus lamarck. (Philippine Striped Geniactanthus). When sexually mature, say 5 inches in body length, this is the easiest angelfish to sex. The male has distinct pale blue markings at the root of the pectoral fins. In the female, the broadest dark band on the body continues into the tail and she lacks the blue markings.

Geniactanthus species. (Philippine Zebra or Swallowtail Geniactanthus). This is a very interesting species which apparently has two distinct, but to some extent interchangeable, colour forms. When first imported, the fish may have a light gold body and a pale tail fin with two heavy dark bars in the outer caudal rays. Alternatively, the fish may be blue-grey with numerous thin, vertical dark stripes, the tail being a lighter continuation of this pattern, and with a pale blue coronet at the top of the head. On occasion the striped version can change colour, within a matter of two or three days, to the gold form. I have seen this several times, but never the reverse case, and I cannot testify as to its sexual nature.

Pomacentrus imperator. (Emperor Angel). I have only one possible clue to offer here. Some 50% of Sri Lankan imports over 7-8 inches sport elongated final dorsal rays, along the lines of the Threadfin Butterfly, *Chaetodon auriga*. I have never been in a fortunate enough financial position to attempt mixing two Emperor Angels in the same tank, but anyone who can, may find this helpful.

DRAGONETS

Synchiropus splendidus. (Mandarin). Here is another very easy fish to sex, assuming they are of a reasonable size, 2 inches or so. The male has very elongated leading rays on the first section of dorsal fin which the females lack.

Synchiropus picturatus. (Psychedelic or Spotted Mandarin). I have seen a poor photograph of two fish which appeared to

be this species. If so then the males here also have an over-developed dorsal fin. It is only recently that this fish has become widely available in England and I have yet to see a definite male.

OTHERS

Seahorses and Pipefish. These are, without doubt, the easiest marine fish to sex, but I never fail to be surprised by the number of people unaware of the fishes' egg-brooding habits. In both groups the males brood the eggs. Male seahorses have a very distinctive pouch on the belly while male pipefish have a less obvious, but easily seen, brood slit along the belly.

Hoplolatilus purpureus. (Purple Tilefish). The "male" of this recently imported Philippine fish was only scientifically described in January 1978, and is one of the most spectacular new-comers to the hobby. Basically a mauve-purple fish with a more intense dorsal stripe running from nose to caudal peduncle, it has two brick red bands in the upper and lower caudal rays. A very similar, body-shape, fish also appears occasionally from the Philippines. This is a dull brown in body colour but does show traces of redder bands in the tail and may be the female of the species. Interestingly, the two purple fish (paratype and holotype) used in the TFH description were both tentatively identified as males. Unfortunately, this is a very expensive fish, in England at least, so only our more wealthy colleagues will have the opportunity of putting theory into practice for the foreseeable future.

Anthias/Pseudanthias species. There are an increasing number of species of wreckfishes appearing on the market, most of which sport colours in the purple, red, orange, pink range. These are generally imported in numbers which allow comparison between valid numbers of a species and in many, the females are notably drabber fish. One species from Sri Lanka is clearly sexually dimorphic (from first-hand witnessing of a spawning). The male of this orange-pink fish has elongated caudal and pectoral rays and a reddish brown obtuse triangle in the tail.

Let me stress, this article does not claim to be a definitive guide to sexing marine fishes, merely some possible guidelines which, hopefully, may prove of use to those hoping to breed marine fishes.

News

Top Awards for Eheim at Trade Show

The Eheim Pond Filter 3351 walked away with two top awards at the Pet Trade and Industry Exhibition held at the Alexandra Pavilion on 28-29 September. It won not only the **Best Aquatic Product** award, but also that for the **Best Overall Product**.

The 3351 is a modular filter which comes complete with its

own pump (the already established Eheim 1051 Garden Pond Pump) and is designed to provide biological filtration for ponds up to 4000 litres (approx. 890 gallons) in capacity.

The pump can deliver 20 litres of water per minute at a current consumption of only 28 Watts. The modules, or cartridges, themselves (there are 8

of them) can be individually removed for cleaning and can be arranged in a number of configurations to suit a variety of pond shapes. It is also possible to add extra cartridges to the basic system for use in larger ponds. Flexibility is, therefore, one of the key characteristics of the 3351 whose "super-flat" shape also makes it suitable for shallow water use.

The top surface of the cartridges have two rows of slits which, it is claimed, ensure that particles of dirt are uniformly sucked into each chamber for mechanical and biological filtration by the foam inserts.

After it has been cleaned, the water is spurted back into the pond via a jet pipe in the



The Eheim pond filter 3351

form of a 1.05 metre-high attractive fountain, thus aiding aeration.

A by-pass pipe adds further to the flexibility of the 3351 by providing an additional spout via which water can be directed onto a watercourse or fall.

Recommended Retail Price for the Eheim Pond Filter 3351 is £99.00.

For further information, contact John Allan Aquariums Ltd., Eastern Way Industrial Estate, Bury St. Edmunds, Suffolk, IP32 7AB. Tel: (0284) 5051/2/3.

Whispers Win Again

For the second year running **Whisper Aquarium Motor Filters** have been voted the best new product at the American Show run by the American Pet Product Manufacturers Association.

Last year, this prestigious award was also won by Whispers for their **Whisper II Power Filter**. This year, the award was won by the more powerful **Whisper III** model which will be launched in the United Kingdom within the next few months, and which is suitable for even larger aquariums.

These motor filters have

many convenience features, including a very large filtration area which is made possible by use of a "Bio Bag", an Allan Willinger development which fosters aerobic bacteria and enables the aquarium to achieve spectacular clarity.

Whisper Power Filters are suitable for use on aquariums with frames up to about 9in wide, which covers the majority of aquariums manufactured in the United Kingdom.

For further information, please contact: Mrs K. Mole, Interpet Ltd., Vincent Lane, Dorking, Surrey RH4 3YX. Tel: (0306) 881033.

Allan Willinger (left), designer of Willinger products which include Whisper Air Pumps, is clearly delighted with the success, as are his brothers, Harding Willinger (centre), President of the company, and Jon Willinger (right), Executive Director.



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will change into a four column page. There will now be an option of a bold type entry. Any further information, don't hesitate to call

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