

MARCH 1986 95¢

# AQUARIST

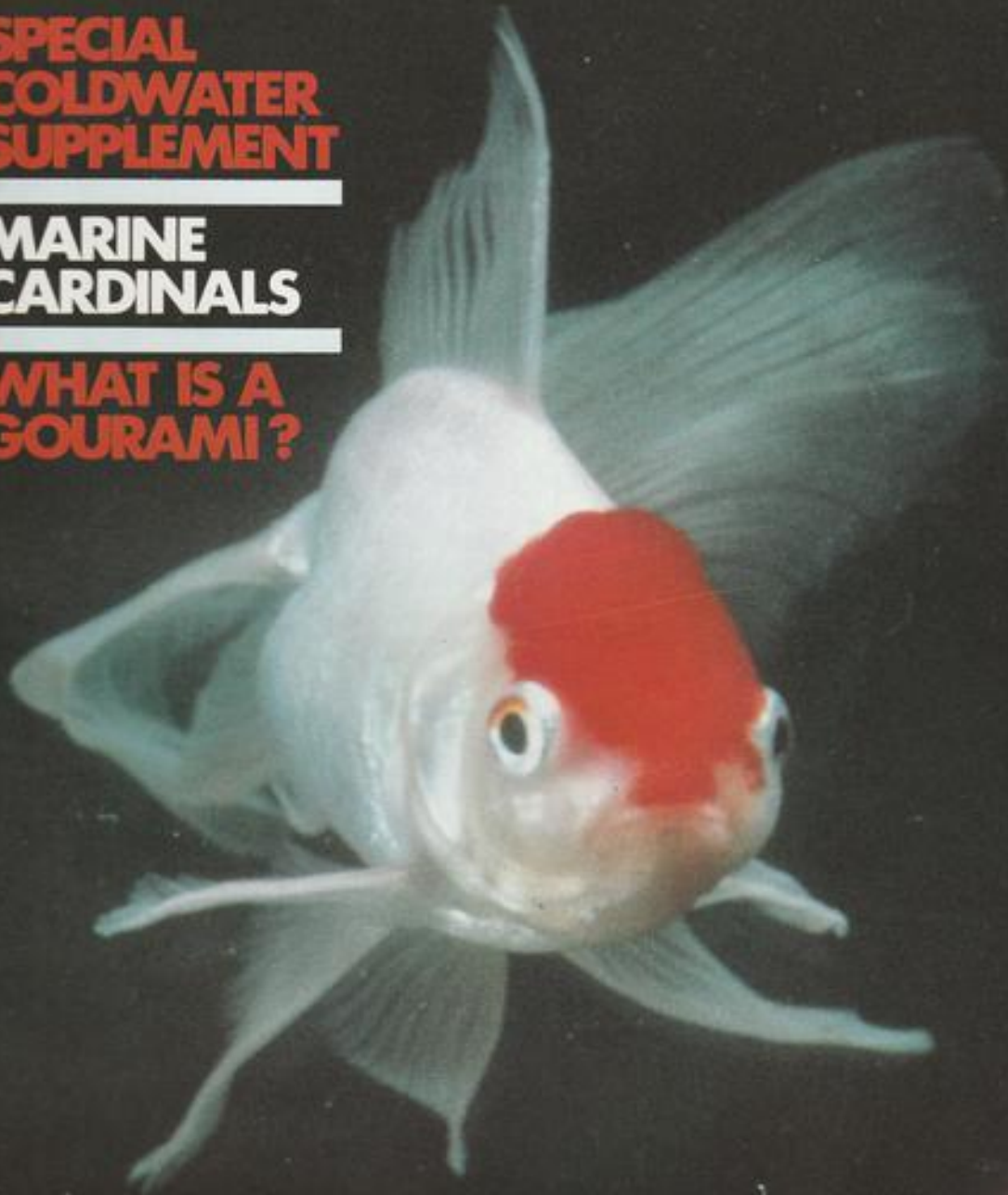
AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

**SPECIAL  
COLDWATER  
SUPPLEMENT**

**MARINE  
CARDINALS**

**WHAT IS A  
GOURAMI?**



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#### Cover Story

*Photo by Noreen Tan*

Fashions come and go but the Goldfish remains. Its popularity is such that the Goldfish is believed to be the most commonly kept pet in the world. Bearing in mind that the term 'pet' includes dogs and cats as well, this represents an exceptional achievement.

Nowadays, many Fancy varieties, such as the Red Cap Oranda, are readily available at reasonable prices in most fish shops. These attractive red-headed fish are usually sold as relatively young specimens which, while carrying the characteristic red pigmentation from their earliest days, will not develop their raspberry-like hood growth until, at least, their second year. According to the Standards established by the main coldwater organisations, Orandas must have round bodies (approaching a spherical shape). Their contours must be smooth, and the head short and deep, with widely spaced eyes and a small mouth. The dorsal fin should be long, with rounded ends and carried erect, while the caudal should be long, double and flowing (as in Veiltails). The anal fin should also be double. The hood (cap) should cover the whole of the head and should protrude from the general bodyline. Orandas are not well suited to pondlife and should, therefore, be kept in aquaria.

# AQUARIST

AND PONDKEEPER

MARCH 1986 Vol. 50 No. 12

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# SEEING THROUGH KEYHOLES

by Amanda Grimes

**A**lthough I am housebound, I am very fortunate in having a boyfriend who is crazy about fish. With the star sign of Pisces, the surname of Rivers and a dedication to carp angling, I'm not sure he had much choice. Having already taken on the job of Tank Technician—doing the fiddly, clever jobs and leaving me to arrange the landscape—he now became the Fish Buyer.

Within the first month, we had stocked the four-foot community tank with much enthusiasm and a little knowledge culled from borrowed books. A pair of Kribensis (*Pelvicachromis pulcher*) took pride of place among a motley collection: one red-finned shark, two chain loaches (*Botia sidhimanki*), two Platies, a sucking loach (*Gyrinocheilus aymonieri*), two small marbled Angelfish (*Pterophyllum scalare*), two *Corydoras jullii*, two Skunk Botias (*Botia horae*), a pair of Dwarf Gourami (*Colisa lalia*), eight Zebra Danios (*Brachydanio rerio*), two Keyhole Cichlids (*Aequidens macramorosi*) and various others—including four refugees from our friend, Bill Hastings. He gave us a Flying Fox (*Epalaeorhynchus hallopterus*) who was about five times as long as his name and was duly restored to his owner about a month later, having created havoc with his torpedo flights across the tank; a lone Striped Barb (*Barbus fasciatus*) and a pair of well-grown *Corydoras aeneus*, which Bill thought we would like to try breeding.

As I have said, the Kribis took pride of place, a true Antony and Cleopatra. He had a glorious gold Roman-style dorsal fin and she was a real gypsy, decked out in her glad-rags almost continuously and dancing fit to bust. Wherever he went in the tank, she would appear, curving and glowing, enticing him with a deep red abdomen. He, in turn, went through the motions. He coloured up, got very excited and rushed into the nearest cave—we had provided

about six of them—quivering and spitting gravel out in heaps. Then he would come to a full-stop. He'd emerge from the nuptial chamber, all colour gone, and look dreamily and vaguely at his waiting mate, then sail off to find some food!

After a month of this, we turned our attention to the Keyholes. Unlike the Kribensis, we knew that one of each sex wouldn't necessarily form a bond—and we didn't even know if we already had a male and female. The larger fish did, indeed, have longer fins, but we'd read that this still wasn't a reliable guide. So we bought four more. The newcomers were much smaller but grew quickly—I've found this is usually the case when introducing smaller fish of the same species—and we soon had six large Keyholes. By this time, it was impossible to distinguish between the originals and the newcomers. We left them to it.

Eventually, two fish split away from the pack and started to clean various pots and rocks. Following the advice given in books, we found two smooth, round stones the exact colour of these fish and placed them in clearings, one either end of the tank. Having bought a spare two-foot tank, but feeling that the Keyholes would need a comfortable three-foot to actually breed in, we had it in mind to remove the eggs which would, we were confident, be laid on the smaller stones. We had also been told that Cichlids tend to ignore their first brood of eggs, eat their second, and raise their third. With this pattern in mind, we didn't feel so bad about removing a batch that wouldn't, in all probability, survive in the community tank.

Needless to say, both fish ignored these stones and started intense cleaning of a large, wedge-shaped, flat rock that connected the higher back of the tank with the front. This rock was huge and we had nicknamed it the 'motorway' as, being devoid of overhanging plant, it provided a quick escape route from the

clear front into the densely-planted rear for bullied or nervous fish. It would have been impossible to remove this rock, with any decent covering of water, to a raising tank—and the fact that it was also sitting on a bed of peat made any attempt to move it out of the question.

Triumphantly, I put one of the round, beige-coloured stones on the 'motorway'—a move about as subtle as a brick but worth trying. The fish, being left without any substantial portion of the original rock, deeply resented this intrusion and one of them, to our amazement, set to with a will, in an attempt to pitch it off onto the gravel. It literally put its mouth against the stone and pushed! After about an hour of this, we took pity on the fish and removed the stone. At this point, the Keyhole told me exactly what it thought of my tampering. They don't actually bite but have a ferocious suck, similar to a slight electric shock. I took the hint and we left them alone.

That evening, we were treated to the sight of a female Keyhole laying eggs on the motorway. She laid them in short lines, moving away for the male to fertilise them. Their markings were slightly different and we could now tell who was who. He sailed majestically forward and ate the eggs. Unperturbed, she laid some more and waited for them to be eaten. So much for ignoring the eggs—they'd gone straight on to phase two!

Several weeks later, rock cleaning started afresh. This time we were ready. We'd set up the two-foot tank with water from the community tank, some plant and the two stones, plus a larger pale rock they'd shown a liking for. We also decided to separate them for a while—to provide incentive! The female was put in this tank and instantly turned a deep chocolate brown and sulked. We gave her some *Daphnia* and left her to recover. She didn't. So we capitulated and introduced the male. He turned dark brown as well and the next few days left us feeling very guilty, under the resentful gaze of motionless, unfeeding fish.

Back in the community tank, they took on full colour and the female laid eggs on the motorway. The male ate them. The next evening, the 'male' laid eggs on the motorway. . . .

In those days, we had a very good local shop—now burnt down—which swapped fish with us. The two female Keyholes were bagged up and Colin took them down, with the message: 'Two good breeding females—if you can find a male'. We are still looking for a good breeding pair of fish as I would love to give them another try. Back in the Ice Age, when I was at school, we had a Christmas concert that was a sort of 'Beyond the Fringe'. One of the sketches was a song, sung by a monk to a nun. It was very short and went like this: 'If you were the only girl in the world, and I was the only boy; Nothing. . . .'

Do you know what a Gourami is? John Dawes appreciates the difficulties, tabulates the species involved and offers some assistance albeit concluding that the name is a loose term for this fascinating group of Anabantoids

Photographs by the author

# WHAT IS A GOURAMI?



Above: *Trichogaster trichopterus* is found in numerous colour varieties. Seen here is a Blue male spawning with an Amethyst female  
Below: A firm favourite with aquarists is the Thick-lipped Gourami (*Colisa labiosa*). This is a mature male



**H**ave you ever tried describing a particular fish, briefly but accurately, to someone who who has never seen the species or variety concerned and wouldn't recognise it anyway even if (s)he fell over it? Just try . . . you will realise in no time at all that you are tackling a very difficult job indeed. Unless you are absolutely brilliant at this task (and very few people are—I unreservedly and unashamedly include myself among those who are not), you will find it next to impossible to do justice to the fish in question and will almost certainly fail.

One of the reasons for this is that words 'get in the way.' You may know what a fish looks like, but describing, say, the colours exhibited by a Thick-lipped Gourami (*Colisa labiosa*) male in full breeding regalia is, well, something else! Verbal language is a beautiful tool but, alas, like everything else, it is imperfect.

To make matters worse, we often take things a stage further and use language in such a loose way that we can create more problems than we actually solve. Take, for example, the title of this article. Could you, honestly, define the term Gourami?

If someone showed you a *Colisa lalia*, you could safely say that it was a Gourami—a Dwarf Gourami, in fact. But if someone then asked you, "Yes, but what is a Gourami?" my guess is that you, like me, would find it virtually impossible to come up with a concise, foolproof definition.

You could start by saying that a Gourami is a fish belonging to the genus *Colisa*. You could start like this—but if you did, you would be wrong. It is quite true that all the species belonging to the genus *Colisa* are regarded as Gouramis.

For example:

\**Colisa chuna* is the Honey or Honey Dwarf Gourami

*Colisa fasciata* is the Giant, Striped or Indian Gourami

*Colisa labiosa* is the Thick-lipped Gourami

*Colisa lalia* is the Dwarf Gourami (also available as the Blue/Neon/Sunset Dwarf Gourami and possibly others).

(\*There seems to be a case for renaming this species *Colisa tota*, in accordance with the priority rules drawn up by the International Commission on Nomenclature, but that, as they say, is another story).

It is equally true to say that quite a few other fish are also known as Gouramis. Just take a look at the following list:

*Trichogaster leeri*, the Pearl, Lace, Mosaic or Leeri Gourami.

*Trichogaster microlepis*, the Thin-lipped or Moonlight Gourami.

*Trichogaster pectoralis*, the Snakeskin Gourami.

*Trichogaster trichopterus*, the Two-Spot, Three-Spot, Blue, Brown, Lavender, Amethyst, Opaline (Coeby), Gold or Platinum Gourami—also (rarely) known as the Hairfin.

*Trichopsis pumilus*, the Pigmy Gourami

(a name sometimes used for the next species as well).

*Trichopsis schalleri*, the Sparkling, (Pigmy) or Schaller's Gourami.

*Trichopsis vittatus*, the Croaking Gourami.

\**Parosphromenus* spp., the Licorice Gouramis (including *P. deissneri*).

*Sphaerichthys* spp., the Chocolate Gouramis (including *S. ophromenisoides*).

*Malpulatta kreiseri*, the Mottled Pointed Tail Gourami.

*Helostoma temminckii*, the Kissing Gourami.

\*\**Osphronemus goramy*, the Giant Gourami (or simply the Gourami).

(\*Note the way that 'm' and 'n' are back to front when compared to \*\**Osphronemus*. This was a mistake by the original author of the name. However, the rules of nomenclature dictate that this unintended slip-up cannot be changed).

Quite an impressive list, isn't it? At first sight, it seems long but uncomplicated. However, when we start looking at it more closely, we begin to realise that things are not quite as straightforward as they may seem.

One of the first major discrepancies that comes to light is that the list includes representatives of three separate families. *Colisa*, *Trichogaster*, *Trichopsis*, *Parosphromenus*, *Sphaerichthys* and *Malpulatta*, all belong to the family Belontiidae. *Helostoma* is the sole representative of the family Helostomatidae and *Osphronemus* is the sole member of the family Osphronemidae. Since the last two families only contain a single species each, they are known as Monotypic (a 'second' species of *Helostoma*, *H. rudolfi*, which sometimes appears in aquarium literature is now regarded as no more than a synonym occasionally applied to the pink form of *H. temminckii*).

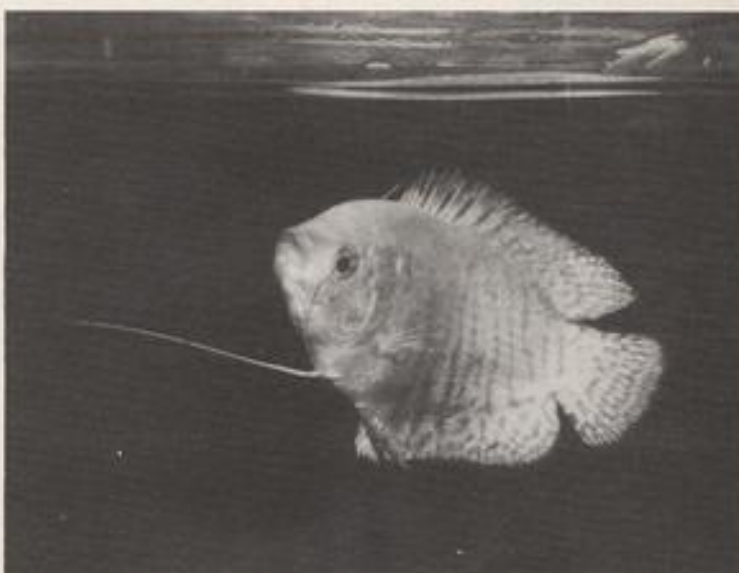
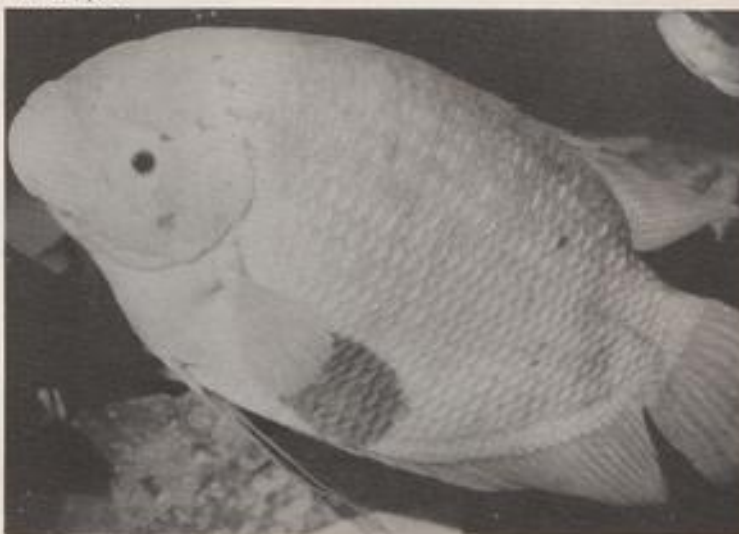
Those readers who are familiar with Anabantoids will have noticed, no doubt, that the family Belontiidae contains quite a few species not listed above. The Combtails (*Belontia* spp.), for example, belong to this family (see David Armitage's article on these fish in the January 1986 issue of *A & P*). So do the Paradise Fishes (*Macropodus* spp.—some species are now being referred to as *Parosphromenus* on the Continent and in the States).

Then, of course, there are all the Fighting Fishes (*Betta* spp.—again, other names, such as *Pseudobetta*, are being used abroad).

If all these fish belong to the same family as some of the Gouramis mentioned earlier, why do we not regard them as Gouramis as well? There really isn't a satisfactory answer to this.

Some books will say that Gouramis can be distinguished from other fish because they possess an auxiliary respiratory organ or chamber, called the labyrinth, which is located above the normal gill chamber. This allows these fish to take in oxygen directly from the atmosphere (some species are so dependent on it that they will drown if they are prevented from surfacing for air). While it is true that all Gouramis have labyrinth organs, not every fish that has a labyrinth organ is a Gourami.

Below: *Osphronemus goramy*—is this the only genuine Gourami in existence?  
Bottom: Several varieties of the Dwarf Gourami (*Colisa lalia*) have been developed in recent years



Fighters, Combtails and Paradise Fishes all have labyrinths. The same goes for the Climbing Perch, *Anabas testudineus* (family Anabantidae). Yet, none of these fishes are Gouramis.

In the end, no matter how many twists and turns we may bring to our arguments, we keep coming back to the same point—we do not have a satisfactory, all-embracing definition for a Gourami. This is quite understandable, though, when you bear in mind that not all the genera in the same family are regarded as such, while members of two others are. What an unusual situation—to put it mildly!

If there is a genuine Gourami, it must be the giant of them all, *Osphronemus goramy*. This species is believed to be the 'oldest' Gourami owing to some

*Osphronemus*-type fossils found in rocks whose age has been estimated at around 26 million years.

Whether we can define the term Gourami or not, the fact remains that those species which carry the label are all fascinating and beautiful, each in its own way. One thing is definite, Gouramis will always be regarded as strong favourites by aquarists the world over—and quite rightly too.

**Note:** If you would like fuller information on these and other Anabantoids, why not join the Anabantoid Association of Great Britain? For details, contact the Secretary, Ron Wright at 141 Military Road, Colchester, Essex CO1 2AT. Enclose a stamped, addressed envelope.

# What's your opinion?

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



## Depletion of coral reef fishes. Should there be more control?

The morality of keeping aquarium fishes caught in the wild is a problem that has not concerned me too much over the years; however, it's a topic raised by Mr. Thomas J. Davie, of 25 Buse Crescent, Dykehead, Shotts, Lanarkshire. He writes: "In the light of reports by Dr. Elizabeth Wood (see p.52), on the serious depletion of numbers of and different species of marine fishes from reefs in Sri Lanka and Singapore, isn't it about time that we, as aquarists, became more responsible for the animals we so lovingly cherish?"

"As a previous keeper of marine fish when I was a young teenager—I am now 23—I now look back on that period with sorrow when I think of the beautiful animals that I let die through my ignorance and lack of thought about them, even though I would say I was quite a caring aquarist. Although I understand that now things are much improved, with the development of new techniques and more understanding of the way the fishes work, I cannot justify myself or any other amateur aquarist in keeping wild-caught fish as not only do the fish not live their normal lifespan, but the fact that so very few species of marine fish have been bred in captivity means that when the fishes die, no offspring at all are produced to live either in tanks or to be put back in the sea. The effect on the reefs must be devastating."

"I think that perhaps if more were written about the subject in a reputable magazine, such as yours, and if other readers were to air their views, then perhaps people might be persuaded not to buy the fish. I have known of a number of aquarists with similar experiences to myself who have been put

off and who say that these fish should not be kept."

"The idea that it is fair to keep a one or two foot shark in a six foot tank is horrible to me. I am sure that the average aquarist has no real wish to make a species rare by continuously taking from the wild; so perhaps a series of re-education articles would help. I also realise that this sort of thing would not be good for advertisers, shop owners, etc.; but what is more important?"

"I don't keep marines any more; just a few goldfish in a large tank. Some day I may go back to keeping freshwater tropicals as they are mostly captivity-bred; but I would not, in the future, keep marine fish unless there was some regulating authority in control saying which fish could be kept, what size of fish was allowed, what minimum size of tank permitted, and which could assure me that the fish that I bought were tank-bred."

You raise some interesting points here, Mr. Davie. It's possible that some species in the wild are being depleted by aquarists. Please drop me a line or two if you have any specific evidence. Most of my tropical freshwater fish look as if they have never seen the wild—which is probably why they lack some of the sparkle that fish had a score of years ago.

Drop me a line if you have bred any unusual or rare species. I think some of our commercial contributors could surprise us in this context.

### Spray polish

Today I received another Christmas card—welcome even though it is 4th January because it's the only one I received from readers in 1985. Miss Margaret Cairns is a regular reader, regular correspondent and regular sender of Christmas cards. She resides at No. 4 Watts House, 105 Wormington Road, London, W10 5QG, and her tale of unbelievable woe explains the late arrival of the Christmas card. Her discus had started a three-way spawning display that implied that the big blue male might just be going to spawn with both females. Miss Cairns had seen angels make a breeding trio several times, but not discus. They were as tame as cats and didn't mind her cleaning the front glass of the tank for photography. At that moment a neighbour asked for Miss Cairns' assistance with an ailing relative and she was away most of the night.

Miss Cairns continues: "Did you know that spray polish on a nylon cloth can spontaneously combust? I didn't—but I do now. It took out the wooden base of the tanks and burned through the carpet

and underlay. The heavy, polluted smoke was forced through the filters, killing every fish in the living-room. The mess was incredible; and I trapped a nerve in one thigh and did something to my right hand and shoulder while trying to deal with it." Miss Cairns was semi-helpless for about four months as a result. Her fish are now down to some livebearers, barbs, etc.; one big, tame clown loach, some gouramis that don't actually do anything, four nearly-mature firemouths, and a nice, exhibition, spawning pair of kribensis.

"I'm hoping to restock a bit at the Aquarist show. The prices here are wicked: would you believe £4.50 for a 10p-sized angel?" she writes. (Hope you have better luck in 1986, Margaret.)

### Aquarist societies

Mr. Alister Brutnell of 10 Shelthorpe Road, Loughborough, Leicestershire says: "I have been keeping tropical fish now for seven years and I was a member of the Loughborough and District Aquarist Society for three-and-a-half years, until it was wound up in 1984 due to lack of members. I would like to set up the Loughborough club again—perhaps under a different name, and looking for members a bit farther afield. Anyone in the Loughborough area wishing to set up a new aquarist society, or anyone who has any ideas on how to set up a successful aquarist society, can contact me at the above address. I look forward to writing to you again."

### Plant problems

Miss Andrea Middlemiss of 7 Garcia Terrace, Fulwell, Sunderland, Tyne & Wear writes: "I have just sent for some *Cryptocoryne* plants. I seem to be able to grow most plants except for the ordinary ones—*Vallisneria*, *Cabomba*, *wistaria*, etc.—and I often wonder where I'm going wrong. One of my tanks is filled with flourishing Amazon swords. They really should be thinned out—but I can't bring myself to do it. Happy New Year! (I know the feeling, Miss Middlemiss. I hate to clear out excess plants unless I can find someone who'll take them. I suggest you stick with those plants that you can grow well—which is what I do; although occasionally I like to try a new plant. Quite some time ago I bought a couple of plants of what I call the African fern, *Bolbitis hendeloni*. They have grown slowly and are now spreading nicely. I find that African fern, Indian fern, Java fern and Java moss all like similar conditions and grow well together. The same applies to most *Cryptocoryne* species.)"

# 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:

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Eberhard Schulze

## Tropical

### Mormyrids

*I have been considering keeping Mormyrids for some time, but due to some very off-putting advice had not got around to it.*

*However, after the article in the September, 1985, issue I have decided to take the plunge. I would like to set up a 3 ft tank with perhaps 3 or 4 of these fish. Could you please advise me on the amount of fish that would live happily in this size of tank: the optimum P.H. and how I would go about achieving this (I want to use an external power filter) also can you please tell me how to sex these fish as up to now no book has made any reference to sex? I would like to try and breed them, but will be happy if they are happy.*

The family Mormyridae contains over 100 species and all are freshwater species confined to Africa. Most have poor eyesight and rely on a kind of radar to get around in the usually dark waters of their natural habitat. The fish use their elephant-like snout to grub around in the mud for a mainly carnivorous diet. Hence you need to reproduce these conditions, ie, mud, sandy or peat base—no gravel—and well planted or dimly lit tank. The fish is a gorgier and to be healthy must be fed until the stomach

bulges. Use earthworms, shredded meat, clean tubifex and Carnivore flake. Water chemistry is not important and  $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$  is their normal temperature range. There are no records of the fish being bred in captivity and no obvious sex differences—so you are at the frontiers of knowledge. If you succeed in breeding the fish let us know how!

### Angel fish

*I have a tank 36 in. x 13 in. x 13 in. and now have 12 Angel fish. Sizes from half inch to 2 inches. My tank had been going for five weeks, when I included the second half dozen angels.*

*The fish are: silver angels 2; marble veiltails 2; veiltail zebra 2; golden angels (2 in.) 4; 2 golden marble (2 in.).*

*I would like to breed angels and I am wondering if it is alright for the mixed types in the same tank?*

No, it is not good practice to mix Angels in the breeding tank. A pair have to protect their family and fighting may well occur—you must isolate the breeding fish.

If you choose a pair from your list of angels that are different varieties they will still breed but produce 'mongrels'. It has taken breeders many years to breed a vigorous line of a true variety, whether Silver, Gold, Marble, Veil, etc., and you should maintain the line by choosing your breeding pair carefully.

## Coldwater

### Perch

*I have a four foot tank and would like to keep one species of British fresh water fish. Which one can you suggest?*

The most handsome of our fresh water fishes is, in my opinion, the Perch, (*Perca fluviatilis*). Its darkish-green body has several black vertical stripes and red fins. This fish can reach 5 lbs. in weight and so obviously only small specimens can be kept in a tank the size of yours. Three or four fishes of about four inches long would be adequate. These fishes are carnivorous and live on small fishes such as Minnows, Sticklebacks and small Roach, etc. They have huge mouths and so can take fishes almost half their size. In captivity they will take earth worms, maggots, etc. The tank should be well planted and *Vallisneria spiralis* a good variety. Do not have too light a position for the tank nor give a strong artificial light as the fishes are inclined to lose much of the attractive colouring in such circumstances. The tank should have the ends and back well covered. No warmth is necessary but the water must at all times be very clear.

### Transporting goldfish

*In a few weeks time I shall*

*be moving house to an address sixty miles away. I have a pond in my present garden and there is one in the garden of the new address. My problem is: how to move a number of goldfish safely on a journey of about two hours?*

There should be no difficulty in moving the fishes this distance. Thousands of fishes are moved hundreds of miles every week quite safely. They are transported in plastic bags in strong cardboard containers. You should be able to get some from your local aquarist shop. Do not feed the fishes for at least two days before the move. Catch the fishes carefully so that none of their protective covering is removed. Tie the top of the bags securely but leave a fair amount of air space at the top. When travelling, see that the bags are kept as cool as possible. On arrival, open the bags and freshen up the water. Do not use pond water for filling the bags but tap water.

### Dragonflies

*Each summer I notice large dragonflies hovering over my pond. Can they sting or harm my fishes, especially the very young ones?*

I assume that you refer to the large dragonfly and this certainly cannot sting. When they hover over the water they may be laying their eggs. Although the perfect insect cannot harm your young fishes, it is a different story concerning their aquatic early life. As

such they are known as nymphs and spend up to two years on the bottom or crawling up water plants in search of any forms of life they can find. They are very voracious and can kill and eat very small fishes.

## Swim-bladder trouble

*I have a moor in a tank of mixed coldwater fishes and every time it feeds it floats to the surface and does not seem to be able to swim properly. Can you give any reason please?*

In the first place some of the short bodied fishes do have this trouble. It is because the swim bladder is rather restricted and any food going into the stomach may cause pressure on the bladder. You are feeding with dried food and you may like to try using this food only after it has been soaked so that it sinks to the bottom. Goldfish are not normally surface feeders but search the bottom for food most of the time. When feeding from the surface they can suck in air as they try to take the food. This may have an effect on the inside of the fish and cause pressure.

## Discus

### Keeping Discus

*I would be grateful for your advice and comments on the keeping and breeding of Discus.*

*I started keeping Discus in August 1985; they are the first fish I have kept. I keep them in a 72 in. x 21 in. x 21 in. tank along with a few small Neon and Red-nosed Tetras. I am fortunate enough to be able to obtain good quality demineralised water with a conductivity of 0.65 uS and a pH of 6, which I mix with tap water.*

*I have thirteen Discus in the tank; the filtering system is a Eheim 2017. Is this sufficient? I do two water changes per week with 8 gallons of demin water and 10 gallons of tap water. I would like to know how to set-up a breeding tank in the future, the fish at present are about 4 in. in size (8 Turquoise and 5 Browns). Could you*

*please give me some information on Optima filtering medium.*

I know a few hobbyists who started their fishkeeping at the very deep end with Discus fish and none of them has had any real disaster. It just goes to show that the keeping of these lovely fish is no longer such a great problem. I very much hope that you also will find it plain-sailing.

The three most important points to remember when starting with Discus fish are (1) the availability of a suitable water; which means a water with a hardness of about 3 to 10 dGH and a pH of about 6.5, (2) a good filtration system and (3) good and healthy fish.

You have certainly opted for the best power filter one can buy and you will find that it pays in the long run only to use quality equipment. To improve your filtration even further I suggest that you either build yourself, or have it specially made for you, a 'trickle filter' which could either be housed above or below the tank. This system was used by me more than ten years ago; although there have often been many adverse comments it is slowly coming back.

Depending on the size of your breeding tank I would basically run it with an Eheim Thermofilter plus Oxydator. There is no need to have any other equipment in the tank.

I am also enclosing for your information a leaflet on Optima filtering material which is used by many hobbyists to raise young Discus fish since it will take out all harmful substances of the water.

### Reducing pH

*I have been keeping tropical fish for about 18 months and have now decided to keep Discus. I have four Blues and five Red cross Turquoise. I keep them in a tank 60 in. x 12 in. x 18 in. with undergravel filtration with peat moss and I have it planted with Amazon Sword Plants.*

*The fish were about 1 1/2 in. in size when I bought them, they are now 3 1/2 in. My trouble is these fish go through stages from normal bright colours to no colour and then to black in a short period. The diet consists of*

*live bloodworms, daphnia, and frozen beef heart. I keep the temperature at 84°F and the pH is 8.6. I was told by my shopkeeper that this pH is sufficient as they are not wild-caught. I use to keep my tank at a pH of 7.0 using a pH adjuster but it turned the water cloudy.*

*Could you please advise me how to lower the pH without turning the water cloudy and why the fish keep turning black?*

To keep these fish at such a high pH because they are not wild-caught, well, I must say I have never heard such nonsense. Discus fish, whether they are wild-caught or tank-bred are best kept in a water with a hardness of 4 to 10 dGH and a pH of around 6.5 or so. Certainly below the neutral point. This will keep a certain kind of bacteria down which seems to be affecting Discus fish more than any other kinds of soft water fish. I suggest that you measure the values of your water and try to provide your fish with, not necessarily a perfect, but at least with a tolerable, environment, and you will find that the blackening will disappear.

Pb Sauer, will lower the pH values of the water without making it cloudy and also without making it any harder. Aci-Toner will also lower the pH values of the water but will slightly increase the hardness.

## Marine

### More fishes

*I have a fish only aquarium set up (39 x 18 x 12 inches) containing one Common Dragonfish (Pterois volitans) 4 in. and a Picasso Trigger (Rhinecanthus aculeatus) 2 in.*

*I would like to add 2 more fishes = 4 fish total. I have made the following short list of possible tankmates.*

- 1 Spanish Hogfish (Bodianus rufus)
- 2 Six-striped Grouper (Grammistes Sexlineatus)
- 3 Porcupine fish (Diodon bystrix)
- 4 Another species of Triggerfish.

*Question:*

*Would two of the above fish be compatible with the two original fish. If another*

*Triggerfish is possible, which species and size?*

*Any other type of fish which you consider would be compatible?*

*Tank information:*

- 1 Tank filtered by under-gravel filters (shortly to be run by powerheads).
  - 2 Eheim 2013 powerfilter.
- S.G. = 1.022  
Temp. = 78°F  
Nitrite = Less than 0.2 ppm  
Nitrate = Not recorded  
pH = 8.2.*

Your aquarium has a gross capacity of 30.50 Imperial gallons, i.e. almost 140 litres. Allowing for water displaced by your filter bed, rocks, corals, etc., you probably have only 26-27 Imperial gallons of actual seawater. Now, if you abide by my stocking ratio rule of thumb, you will not exceed 1 in. of fish length to each 4 gallons of seawater during your first 6 months apprenticeship period. This means that you have space for 26/4 = 6 1/2 inches of fish only. Once this 6 month learning period is completed you can safely double the stocking ratio to 1 in. of fish to each 2 gallons of seawater = a lucky 13 inches of coral fishes.



Six-lined Grouper

If I were you I would forget the Spanish Hogfish—they come from the Caribbean and all your other fishes are Indo-Pacific species. The Six-lined Grouper, even in a tank as small as yours would, with regular partial water changes soon reach 5-6 inches in length—and have a mouth to match! I can confidently recommend that you could have another gentle triggerfish, say an *Odontaspis niger* (Royal Blue triggerfish) and a juvenile *Diodon* at say 3 in. long. Make sure that your *Odontaspis* is slightly larger than the established Picasso, and feed the existing fishes well immediately before introducing the new boys.



# Helping hand



Nick Lushchan

## Two shops with facilities for the disabled

It is always a pleasure to write about shops that take a positive approach towards disabled fishkeepers. While easy access is a very important part of catering for wheelchair-bound aquarists, even shops which cannot provide this can still be suitable if the staff are willing to help.

Recently, I have been to two different shops not far from where I live. As you will see, these shops are very different in design, but the attitude of the owners and their staff is exactly the same... extremely positive and helpful.

### 1. Bath Aquatic Supplies

A visit to Bath Aquatic Supplies was time well spent. The facilities that Phil Hayden has provided are first class, especially for a person in a wheelchair.

Phil has given a lot of thought to all aquarists, disabled or not. Having spent some time at Pennsylvania Tropicals, he was able to use the experience he gained there to carry out a number of useful modifications at Bath.

Bath Aquatic Supplies are situated very near the main shopping area with nearby public car parking facilities. As the shop is within a small work-unit complex, there is a courtyard to park the car in just outside the premises—a great advantage for the disabled.

The entrance to the shop is via a standard doorway with a small step but, if this presents a problem, there is also an up-and-over doorway that will allow a wheelchair through with more than enough room to spare.

Once inside, you are greeted with a very clean and colourful display of mixed tropical tanks that are all visible to a seated person.

Looking down into the shop from the

doorway, you are able to see a display of marine fish and invertebrates, all easily viewed from a wheelchair. Phil has incorporated two small ponds for coldwater fish, specifically with the disabled in mind. Although, on this occasion, I personally did not require my wheelchair, I could see by the height that viewing for the seated would not be difficult at all.

Bath Aquatic Supplies deal with marine, tropical and coldwater fish. They are also able to provide a mailing service giving the same guarantees as their shop customers enjoy, with a free delivery service in the City itself and a small cover charge for out-of-town deliveries.



The aisles at Bath Aquatic Supplies are very spacious. Partly visible (in front of me) is one of the low coldwater ponds.



The up-and-over door in the background provides 100% trouble-free access for disabled fishkeepers.

### 2. Old Forge Tropicals—Devizes

Although not all premises are able to provide easy access for disabled aquarists, the next shop deserves a special mention. It is The Old Forge Tropicals from Devizes, run by the Cochran family. The shop is based in an old market town and is unable to provide ramps and other facilities due to Local Council Laws. However, the Cochrans have gone out of their way to help wheelchair aquarists. If you phone the shop and make an appointment, they will give you their personal attention when you arrive. This normally

means lifting the chair into the shop and then lifting you through the twisting doorway (this is due to be changed) giving you an opportunity to view the two rooms provided for tropicals.

The tank and stand displays are upstairs but the staff will happily fetch them down for you to view.

The coldwater fish are outside and, once again, this presents no problem as you and your chair are 'flown' onto the concrete paths from where you can view their outdoor display.

Don Cochran is a trader who is well known to the local PHAB (Physically Handicapped and Able-bodied) Club, having provided the members with an evening's entertainment on how to set up a fish tank, with reference made to the names and origins of the 30 different fish he brought on the night.

Well done, Don and family. Keep up the good work you are all doing—we could do with more of your sort.

### A Personal 'Thank You'

At this point, I would like to relay a personal 'Thank you' to Peter and Kath Wray of 27 Lancaster Square, Lyneham, Wilts. They have offered to do my correspondence and typing at those times when this becomes impossible for me to do personally.

Other disabled persons will understand perfectly what I mean. Yet, it is difficult to explain such times adequately in words. So, Peter and Kath, 'Thank you'.

### Keeping a Promise

Last time, I said that I would give a mention to those traders who have started using the Wheelchair Logo in their advertising, or have been doing so for some time. At the moment, the list reads as follows:

1. Reflections Aquatic Centre, 232 North Lane, Aldershot, Hampshire.
2. Springbrook Road Nurseries, 2 Swinebrook Road, Carterton, Oxfordshire.
3. Aquasmall, 91 Longford Road West, Reddish, Stockport, Cheshire.
4. Earl's, 161 World's End Lane, Quinton, Birmingham.
5. Beaver Water World Ltd., Waylands Farm, Tatsfield, Nr. Westerham, Kent.
6. Mr Fish, 90-92 Bromham Road, Bedford.

As always, I will be very pleased to hear from any other traders who take up using the logo. If you can cater for the disabled, please let me know. In the meantime: Good Health and Happy Fishkeeping.

Nick Lushchan, 27 Hungerford Road, Rugby House, Calne, Wilts, SN11 9BH.

# THE CARDINAL FISHES

Coming from a wide range of habitats and having a variety of markings, cardinalfishes are recommended by Dr. Robert Goldstein as having a potential for breeding and raising

**T**he cardinalfishes, family Apogonidae, may well be our most neglected, fascinating, and promising group of marine aquarium fishes. The breadth of types and habitats, the variety of markings, the ease with which species can be identified, and the potential for breeding and raising these fishes all combine to point to the cardinalfishes as a likely candidate group for a marine aquarium society. It is amazing, in fact, that the hobby has not yet produced a marine textbook on this group, but that is just a matter of time, as is the spawning and raising of cardinalfishes by even beginning marine aquarists.

Cardinalfishes occur in all the warm seas of the world. They are abundant in the waters of south Florida and the Caribbean, the ocean off California and farther southward in the eastern Pacific, reaching their greatest species diversity and abundance in the Indo-Pacific region. Several species from various parts of the world are standards with wholesale suppliers, and a number of types are among the easiest of all marine fishes to catch yourself. While several kinds occur at depths of more than a thousand feet, the great majority are among the shallowest occurring marine fishes, often inhabiting tide pools and rock or coral rubble zones less than a foot deep. They also tolerate great variation in salinity regimes. Some species on islands in the Pacific and in Australia occur among very low salinity waters associated with mangrove roots of swampy shores, and there are even

some freshwater Apogonids. With regard to breeding, most of them appear to be mouthbrooders, producing large young that probably can be raised on live *Artemia*.

Typical cardinalfish are small, seldom exceeding three inches in length. Most are bright scarlet, and many of them have patterns of black spots or vertical bands useful in delineating the species. There are other colours and patterns. Some Apogonids are silvery, pink or brown. Some have as many as a dozen thin horizontal black lines. Some do not conform to the typical short, stubby body shape with the two distinct dorsal fins. A few have large canine teeth and can inflict substantial bites. And there are ugly, elongate cardinalfishes, some of them two feet long, that have no teeth at all.

A look at the cardinalfishes from various parts of the world will help to describe their diversity and what they have in common. It may stimulate a general hobby interest in a cardinalfish specialty group. The purpose of getting such a group started is to stimulate more interest in breeding marine mouthbrooders, for there are many others in addition to cardinalfishes. And mouthbrooders are among the easiest of all fishes to breed and, especially, to raise. Because cardinalfishes are mostly mouthbrooders with very large and advanced fry, aquarists are spared the tedium and difficulty of maintaining an algal-rotifer system, and might also experiment with artificial incubation of eggs, as is done

with some high strung cichlids. Given these time tested procedures in the husbandry of freshwater mouthbrooders, there is no reason why the Apogonidae should not be the next group of marine fishes to receive massive attention and to produce breeding successes for aquarists.

In the tropical western Atlantic (Bermuda, southern Florida and the Caribbean) there are about twenty different species of cardinalfishes. Some of them wander as far northward as North Carolina, New York or even Cape Cod during warm summers. Most species are in the genus *Apogon*, and it is not necessary to travel to the Bahamas to collect them. Many can be caught with a tiny (number 18 or 20) fish hook baited with a bit of shrimp and lowered alongside a crack in a concrete bulkhead in a mere two feet of water. Nothing could be simpler than catching cardinalfishes this way in Florida, anywhere from Cape Canaveral to the Keys, even in highly developed metropolitan areas. Of the gaudy marines, cardinalfishes are among the most cryptic, but also among the easiest to catch with the simplest of tools.

Generally nocturnal, they also may leave their lairs to feed during the daytime. They avoid bright light and prefer caves, cracks and other enclosed areas, including holes beneath rocks. Some occur in living caves, as will be shortly apparent.

*Cheilodipterus* is a big, red Atlantic cardinalfish with canine teeth whose relatives all live in other parts of the world. *Apogon*, on the other hand, is represented in the western Atlantic by a

dozen species, a few in deep water areas, but most in waters up to the waveline if rubble is available. Perhaps the most abundant of these is the flamefish, *Apogon maculatus*. Other kinds of cardinalfishes include three species each of *Astrapogon* and *Phaeoptyx* and one species of *Synagrops*. The freckled cardinalfish, *Phaeoptyx conklini*, is an abundant fish that feeds at night on zoo plankton in large midwater aggregations, much like some of the Pomacentrid fishes.

Typically, however, cardinalfishes come out of their caves at night and forage on the bottom in small groups or as loners. Their large and cavernous mouths might lead you to think that they eat big chunks of food, but that is not the case. Instead, like groupers, they open their great mouths and use the current to wash food inside. They select their foods, and do not filter-feed. In this behaviour, they are similar to anchovies which also have great, basket-like mouths, but which select their planktonic prey like canapes. But, like gluttons, cardinalfishes cannot resist a big floating chunk of food drifting past their cave, and will attempt to suck it inside. Collectors can take advantage of this behaviour and catch them with barbless hooks or even with no hook at all, allowing the fish to swallow a large bait before lifting it out of the cave and water in a smooth, steady pull.

One of the more interesting cardinalfishes is the conchfish, *Astrapogon stellatus*. It lives inside the mantle cavity of the queen conch, *Strombus gigas*, an abundant (and tasty) marine snail sought after by shell collectors and gourmets. Several conchfish might occupy a single conch.

Another strange one is *Phaeoptyx xema*, the sponge cardinalfish. It lives inside sponges of the genera *Verongia* and *Callyspongia* in waters too deep for any but scuba diver collectors. The tendency of cardinalfishes to occupy caves, the undersides of rocks, the interiors of sea snails and sponges, and the nocturnal feeding activity indicate an aversion to light, something which should not be lost on the marine aquarist. If an aquarium is to be set up exclusively for breeding cardinalfishes, then both hiding places and a very short photo period should be included in the planning.

Cardinalfishes also frequent the undersides of coral rubble rocks alongside numerous squirrelfishes (Holocentridae). In fact, almost any rock in the Bahamas that holds fishes beneath will have from three to a dozen squirrelfishes but seldom more than one cardinalfish. Grassy patches that contain rubble outcrops or a

discarded pipe or cinder block will often have a dominant Pomacentrid, perhaps a small angelfish and one or two juvenile butterflyfishes, and a single cardinalfish.

Cardinals are readily caught in hand nets. Unlike other marines, they don't flee but rush back into the cave from which they were disturbed. This tendency to seek shelter rather than relying on speed makes collecting a snap. If you turn over a rock, exposing a cardinalfish, it will quickly rush back under that same rock. There is even an Indo-Pacific species, *Apogonichthyoides unnotatus*, that will fall over and play dead when pursued!

The Indo-Pacific region is rich in cardinalfishes. The T.F.H. looseleaf, *Exotic Marine Fishes*, illustrates many species, including *Apogon erythrinus*, *A. fraenatus*, *A. leptacanthus*, *A. nocomfasciatus*, *A. quadrfasciatus*, *A. satoyensis*, *A. maculiferus* of Hawaii, and *Chelodipterus macrodon*.

One beauty common in the hobby and the Indo-Pacific region is *Sphaeramia* (*Apogon* in the looseleaf) *orbicularis*. It is closely related to *S. nematoptera* and both probably come into the hobby regularly via imports. The latter species has a filament on the second dorsal fin, while *orbicularis* lacks the filament and has a narrow body band.

#### Few cardinals in Southern Australia

There are only a few cardinalfishes in southern Australia, none in the genus *Apogon*. In this part of the world, which is probably their lower temperature tolerance limit, these fishes are called cardinal-fishes (with a hyphen) or gobbleguts. *Epigonus lewisson* occurs at depths over a thousand feet and has never been seen alive. The common *Vincennesia novaezelandiae*, or southern cardinal-fish, is red with black spots and purple highlight. Wood's siphon-fish, *Siphania cephalotes*, is silver with black spots and penetrates well up into low salinity estuaries. It has a silvery band on the lower flank, is only two inches in length, and appears to be an ecological equivalent of a stickleback. The strictly marine species, *Apogonops anomala*, has five lateral blotches on a gray-brown body that is silvery below and doesn't look very much like a cardinalfish.

Many cardinalfishes are reported in Smith's *Sea Fishes of Southern Africa*, including representatives of the genera *Chelodipterus*, *Synagrops*, *Epigonus*, *Apogon*, *Archamia*, *Papillapogon*, *Apogonichthys*, *Apogonichthyoides*, and *Hymnodus*. *Hymnodus* has two representatives, both elongate, toothless, deep water forms.

*Hymnodus telescopus* gets to be two feet long. *Apogon nigripes* (meaning black) is actually pink, with bright pink eggs. *Apogonichthys zuluensis* is green, lives in estuaries, and resembles an Eleotrid or sleeper goby.

Spawning follows the typical side-by-side trembling associated with breeding among other kinds of fishes. In some species, it appears that the eggs are normally brooded on the substratum and only picked up for oral safekeeping in times of danger. As far as is known, all the Apogonidae are potential mouthbrooders. Most are male brooders, but there is some evidence that in some species either or both parents may incubate the eggs. Generally, the female lays the eggs in a single mass connected by threads or enclosed in a sac. The male may pick up the entire mass or he may break it up and pick up the eggs a few at a time. As is typical of mouthbrooders in general, the eggs are quite large. However, unlike other fishes which mouthbrood, the eggs may also be quite numerous. As expected, size and number are inversely related. Where the eggs number about 150, they may be 4.5 millimeters in diameter. In *Sphaeramia*, the eggs are less than a millimeter, but extremely abundant. In several incubating males examined, they numbered from 6,000 to over 11,000. Breeding takes place about twice a month, usually during the high tide.

There is a very interesting group of cardinalfishes that has taken the exploitation of brackish water one step further and now resides in fresh water. *Misomus bombonensis* occurs in Lake Taal, also known as the Bombon Lagoon, at Luzon, Philippines. It resembles a sleeper goby and apparently has not been imported to the hobby. Several other species are known from Indo-Pacific islands. Some mangrove swamp species might be adapted to hard, freshwater aquaria.

The cardinalfishes are a diverse group that have been looked at only piecemeal, regionally, and not at all in a systematic way in the hobby. There is abundant literature on them. They may be the marine equivalents of cichlids in breeding habits, with some of them being substrate brooders and some being female mouthbrooders. Those that produce few, large eggs are likely candidates for aquarium breeding.

The problem with the flamefish, and this may prove true with many of the species, is their aggressive territoriality. Although some kinds can be kept in communities, many require privacy and

will kill intruders to their territory. They also need darkness in each 24 hour light cycle and probably enjoy some turbulence and shelter. Feeding is no problem, for they will take just about any live, dried, or bit of fresh food. Scavenging crabs may be kept with them for clean-up duty.

Dealers and aquarists should be on the

lookout for shipments containing cardinal-fishes that are brooding eggs. Such fish should be isolated, or the eggs might be removed for artificial incubation by a cichlid expert. Brine shrimp should be started in several hatches, a day apart. The fish should be kept mostly dark, undisturbed, and in a private aquarium

without any outside filtration, but with undergravel or sponge filtration. Importers and dealers receiving cardinal-fishes in plastic bags should check each bag for released eggs or fry, and take appropriate measures. And then, let me hear from you about what you did and whether or not you attained any success.



Above:  
The Flamefish  
(*Apogeton maculatus*)  
is one of the most  
abundant of western  
Atlantic species.

Main picture:  
*Sphaeramia nematoptera*  
along with *S. orbicularis*  
are regular imports to the  
hobby. The former species  
pictured here has a filament  
on the second dorsal fin absent in  
*S. orbicularis* which has a  
narrow body band.



**C O L D W A T E R**



**SPECIAL  
SUPPLEMENT**

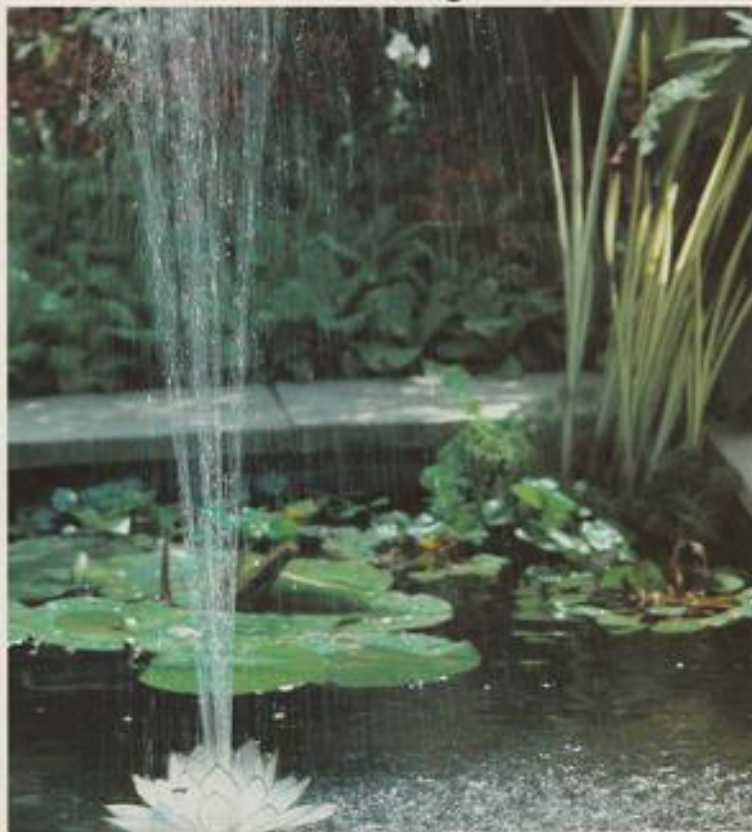
**CHOOSING  
GOLDFISH**

**MYSTERIOUS  
KOI • PONDS  
FOUNTAINS  
WATERFALLS**

C O L D W A T E R

# PONDS, FOUNTAINS, AND WATERFALLS

Bill Heritage



A fountain improves water conditions for fish but water lilies don't like it

If you are thinking of making a pond the first thing you need to do is decide what it is for. If you think that looks like a glimpse of the blindingly obvious you are right, but I have seen so many examples of the disappointment that results from starting off in two minds that the importance of having a clear objective must be emphasised.

Take the case of the man who fancies the idea of a pond full of magnificent Koi. His better half decides there are other ways of employing the money he would have to spend on a large deep pond and sophisticated filtration equipment and good quality fish, so instead he goes in for a conventional pond with Goldfish varieties. For them it doesn't have to

be so deep so he saves quite a bit on the liner apart from saving a bundle on the fish. He can do without a filter altogether by employing the water-purifying qualities of abundant plant growth and that saves an even bigger bundle. It also pleases the better half, who does not share his devotion to fish but does love the beautiful flowers of water lilies and iris and water

fringe and water hawthorn and water violet and crowfoot.

So far so good. But then, perhaps, it occurs to him that although his pond is not quite the thing for big Koi he could, surely, have a few small ones? So in they go and they don't stay small very long. They grow and the plants shrink. They grow and there are no longer any water violet and crowfoot flowers. They grow, all the oxygenates and water hawthorn and water fringe disappear, and even the lilies look severely discouraged. The water is thick and foul and no fish are visible except when a corpse appears. Comes a hard winter and all the survivors expire.

A sad tale but not, I promise you, an uncommon one. It happens all the time. It comes of being in two minds.

#### Best of both worlds?

You will not make that sort of mistake I am sure. If you hanker after Koi, and you can afford them, you will build a miniature swimming pool and equip it with the elaborate filtration system which their destruction of plant life, their gross appetites and their massive output of waste matter make necessary. If you have to face the fact that you would like them but cannot afford to keep them in the style to which they would like to become accustomed, then you will just have to opt for the alternative—and stick to it. You can't have the best of both worlds.

The alternative, of course, is the conventional garden pond, with all the scope it offers for creating a garden feature that combines the beauty of ornamental waterplants with the fascination of fishkeeping, the murmur of a cascade with the scent of water hawthorn, the splash of spray with the flash of dashing Orfe, the satin pink of Rose Arey blooms with the infinitely variable red and silver patterns of Sarasa Comet goldfish.

#### What, where and how

The practical details of what and where and how are easily settled. The site is the sunniest you can find, well clear of the shade and the polluting leaf-fall of trees. Willows, poplars and laburnums are the worst danger, but leaves of any kind, in quantity, become a hazard.

In size the pond will be as large as space and resources will allow, not only because of the greater scope it offers for varied stocking, but because the bigger it is the more stable it will be as an ecological unit, to the benefit of all its occupants.

The best advice I can give about shape is to keep it simple. Complicated shapes are more difficult, waste a lot of liner, and have far less visual impact than a good open patch of water. Pools of irregular outline go well enough where the garden is full of winding paths and borders; a rectangular pool fits well into a patio or paved area; and there are very few situations where a circle, or something

Below: The satin pink of water lily Rose Arey



Bottom: Sarasa Comets and Golden Orfe go well together in a mixed community



very close to it, doesn't look right.

#### The pond profile

Simplicity should be the keynote of the sectional shape of the pond, too. Only two levels are really necessary. For marginal plants like iris, marsh marigolds and zebra rush, a shelf about eight inches below the surface is needed, though it doesn't have to go all the way round. The sides are sloped, but steeply, at about 20° to the vertical, to ensure a good volume of water in relation to the surface area. A main depth of 18 inches is adequate and 24 is better, but there is no point in going deeper. A floor sloping from 18 inches at one end to 24 at the other is a compromise that helps in the pumping-out part of any eventual pond-clearing operation.

#### Fifteen years or fifty

Concrete has a pleasing texture but as a method of giving a hole in the ground a waterproof lining it is often a failure. Once cracked, whether by ice expansion or soil contraction, the only real cure is to line it with a plastic sheet. So why not forget the concrete and use a liner from the start?

The best liner material is a 70:30 blend of butyl rubber with EPDM, having an even higher resistance to the effect of ultra-violet light than pure butyl. At about 35p a square foot (plus VAT) and with a life expectation in excess of 50 years it is a good long-term investment. If something in the order of 12 to 15 years is as far ahead as you are planning you will find laminated PVC at around 20p a square foot an efficient and economical alternative.

Lining the excavation with damp sand, sifted soil, polythene peat bags or old underfelt, will give the liner an even bed free of projections. An equally important tip is to use a spirit level and make sure the pond rim is absolutely level. This means that the water level can be kept well up all round and, in conjunction with paving stones projected two inches over the water, that no part of the liner need be exposed to direct sunlight. This can add years to its useful life.

#### A matter of life and death

Is moving water essential, or even desirable? Essential, no. A static pond can be entirely successful. Desirable—yes and no. Splash is a good thing. Splash oxygenates the water to some extent; even more important it speeds the release of carbon dioxide from the water into the air. In critical spells of thundery weather the splash of a waterfall run at night can mean the difference between life and death for fish. Currents are a different matter. They mean nothing to fish beyond exercise, and most water plants including lilies dislike them very much. Water should be moved, then, over falls, through spouting ornaments or via fountain sprays to create splash, with pump suction and delivery points arranged to minimise currents. In

other words, put the waterfall pump close to the waterfall; take the water out from as close as possible to where it is coming in.

Submersible pumps, that work in the water, need the minimum of plumbing and there are many models available with outputs from 200 to 2,000 gallons per hour and more. Surface pumps, the ones that are installed outside the pond in a pump chamber, are usually favoured for large scale installations.

#### Choosing a pump

Which model you will need depends entirely on what you want it to do. The vital statistics of a watercourse arrangement, for example, are the lift (i.e. the vertical difference between the level of the water in the pond and the highest point of the watercourse), and the width of the widest sill in the watercourse. To ensure that the water pours cleanly rather than dribbling back under the sill you need 50 to 70 gallons per hour for every inch of sill width.

If you want to lift water three feet and have a six inch wide sill, you need a pump that will deliver 300-400 gph at three feet. Your specialist water garden supplier, if he knows his stuff, will have the performance figures of all good water garden pumps at his fingertips. Give him the relevant details and he will be able to recommend the most economical pump to do the job efficiently.

#### Avoiding damage

A vital detail to remember about

pumps, whether submersible or surface, is that although they don't mind a substantial restriction of output by valves or control taps on the delivery side, reduction of flow on the suction side can easily lead to overheating and permanent damage. Submersible pumps should always be raised above the level of sediment and debris on the bottom; and the strainer, whether of a surface pump or a submersible should be examined regularly and kept clear of blockage by algae, leaves or other rubbish.

Below: A submersible pump is placed in the water and needs little plumbing  
Bottom: The splash of a waterfall run at night can mean the difference between life and death for fish





# C O L D W A T E R

# THE MYSTERIOUS K O I

**T**here is a surprising amount of mystery about Koi. Their origins are shrouded in an amalgam of legend, conjecture, hearsay, and wishful thinking! What is generally accepted as fact by most authoritative sources, is that the present population of these most beautiful of fish is directly descended from a genetic freak which first saw the light of day some 100 to 150 years ago, even the date being somewhat of a mystery!

One popular theory has it that the word 'Koi' in relation to a fish was first used in China, hundreds of years before Christianity, there also being an alleged connection with Iran, (Persia as it then was). Suffice to say, whichever of these theories one elects to believe, it appears that the koi mentioned were of uncoloured varieties cultivated for human consumption, until some accident of nature threw up a multi-coloured example.

Among the many superlatives bestowed upon these fish, probably the most appropriate is that of 'Living Jewels' as without any doubt at all, the sight of a shoal of koi swimming around in the clear water of a pool is evocative of a handful of gem stones, difficult to relate with the remainder of the carp family!

The very large number of varieties and colours now available to the amateur koi-keeper are a compliment to the magnificent efforts of the koi farmers of Japan who, over many many years, have perfected the art of selective breeding, no mean feat when one considers that a stock female koi can produce up to half a million eggs per spawning of which perhaps only half of one per cent will grow to be of collectable quality.

Leaving the attraction of colour aside for a moment, the other major attribute of the koi as a 'Pet' fish, is the ability of the average hobbyist to possess fish of a size only normally seen behind glass in major public aquaria such as the London Zoo Aquarium, as in any properly constructed and serviced garden pool, koi of 24 inches length can survive and what is more, thrive! Add to this the ability to hand-tame koi to feed from your fingers and

Probably descended from a genetic freak of long ago, multi-coloured Carp known as Koi are close to the heart of John Cuvelier, who describes some of his favourite varieties

you have the ultimate in relaxing and strain free hobbies.

One other most important point which should be stressed, is that while it is all too easy to purchase 'Specimen' koi at prices in excess of five figures per fish, this should in no way deter the prospective enthusiast. There are pools all over the country containing koi which present the viewer with an absolute riot of colour, yet cost their proud owner anything from only five pounds to fifty pounds per fish, depending upon size when purchased. Those non 'Specimen' koi have been, rather unkindly, tagged with the name of 'Pond Fish', yet are equally beautiful and certainly much kinder on the wallet of Mr and Mrs Average koi-keeper than the overpriced examples found in the connoisseur's pool. Much greater pleasure will be derived from buying a five inch fish for perhaps a 'tenner' and watching it grow to eighteen inches or more in three or four years, than will be gained by buying a ready made 'Jumbo'

for five thousand! If, of course, you are besotted by correctness of pattern etc then you go out and 'pays your money!'

The accompanying photographs illustrate some of the more popular varieties of koi. Like most other pastimes, koi-keeping allows the enthusiast to do his own thing, such as concentrating on just a few varieties if so wished, but to really do justice to their beauty a mixed collection is preferable.

The names borne by the various varieties are as exotic as their appearance and it will take some time and study before the newcomer to the hobby becomes familiar with the variations in colour and pattern etc. Even hardened addicts can sometimes be heard to disagree about the classification of a particular fish.

The word 'Koi', of course, is an alternative title to the full name of these fish which is a bit of a tongue twister, 'Nishikigoi' and indeed the variations in pronunciation of these Japanese derived names are almost as numerous as the fish themselves, but we won't start any arguments on that score!

Strangely enough, the most popular variety with koi-keepers is most definitely not the prettiest, or the most eye catching. The *Kohaku* has a white body with patches of red, the depth and shade of red, together with the shape and position of the pattern, dictating the value of a fish to the koi-keeper. (Broadly speaking, these guidelines apply throughout all varieties!)

A close second as regards popularity is the *Sanke*, a white body with patterns of red and black. Good examples of this variety are very much sought after. If you think things are getting complicated, 'You aint seen nothing yet!'

Moving down the league table, we have the *Shousa*, a black body, with patterns of red and white, again a most sought after variety.

Just to make things a little amusing, combinations of the above characteristics can result in further classifications ie *Shousa-Sanke*, whilst a *Kohaku* with a circular red patch on the head, becomes



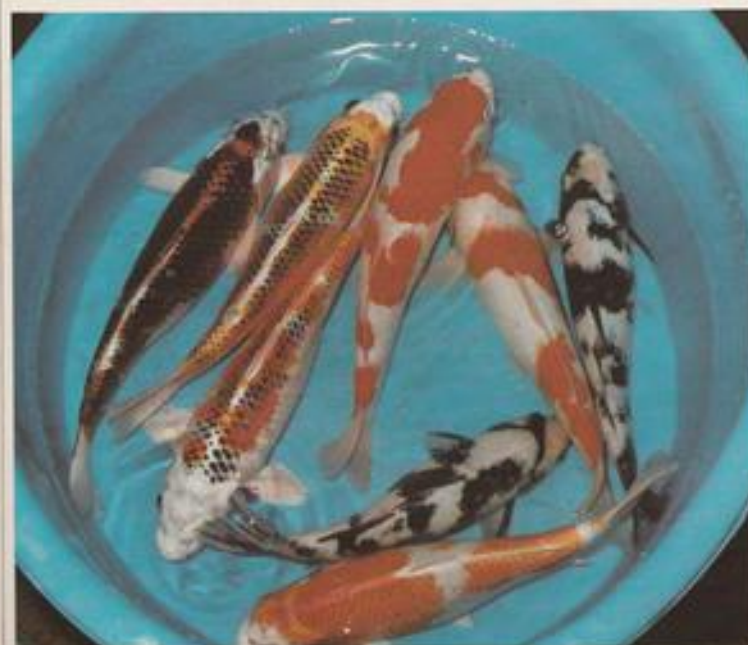
Above: Sanke. A close second to the Kohaku in the popularity stakes, good examples of this variety are very much sought after

Below: A mixed bag of koi giving some idea of the range of colours on offer



Top: Ohgons are most highly prized by the Japanese but many enthusiasts favour the gold yellow and white versions of this variety

Above: A brace of Kohakus, the most popular variety, though not the prettiest



a *Tancho-Kohaku*, and a *Sanke* with red head and black striped fins becomes a *Taisho-Sanke*.

Those of you who are thinking about enrolling for Japanese language lessons at your local Tech' need not really bother as most dealers will readily net a koi for a prospective purchaser in response to a pointed finger, and the words, "That red and white one at the back of the tank".

Some of the most beautiful koi can be found in among the 'Also Ran' classes. The *Ogon* is not highly prized by the Japanese, and yet in the opinion of many enthusiasts, is the variety. Gold, yellow, and white are probably the most popular colours in this variety. A pure white example is known as a *Platinum-Ogon* and really takes some beating in the spectacularity stakes.

Many koi develop brilliant reflective scales known as *Gin-rin*, thus enhancing an already beautiful fish, so a *Kohaku* can become a *Gin-rin Kohaku*, or a *Sanke* a *Gin-rin Sanke*, although it is quite normal to shorten the name to *Gin-Sanke* etc. Told you it was complicated!

If the eyes of some of our readers have not yet fully glazed over, here are a couple more short words to note. *Hi* and *Sumi* represent the colours of red and black. When a Japanese enthusiast remarks upon a koi as having good 'Hi', he means the red is 'Very Red', or in the case of 'Sumi', the black is 'Very Black'. Make sense? In the same way, any white parts of a koi must be pure, dense, and clean, if it is to receive the approval of the 'Purist'. There are dozens of other varieties and sub-varieties of koi, far too many to describe within the bounds of this article, but all deserving of their reputation of being the most lovely of ornamental fish.

Whilst it is hoped to go into some detail of the environmental requirements of koi in later articles, now would appear to be the appropriate time to offer a few words of caution. Those of you already possessing a goldfish pool in your garden and already thinking in terms of buying a few koi to put in it, would be well advised to think again!

Koi are very hardy fish, as are most of the carp family, but they do require more care in the preparation of their living quarters than do say, goldfish, tench, rudd etc., the usual inhabitants of the British garden pond. The hopeful buyer of half a dozen small koi to be thrown into that stagnant puddle at the end of the garden, is virtually certain to lose them all within a few days, quite apart from the fact that should they survive anyway, they will hardly ever be seen through the 'foggy' water.

Should you wish to enter the fascinating world of koi-keeping, there is only one way to do it, and that's the right way. It'll save you money and heartache! Write to the British Koi-keepers Society whose address you will find elsewhere in this magazine. Once enrolled, you will have at your fingertips an absolute wealth of help and information on any aspect of the hobby.

# Coldwater jottings



Stephen J. Smith

Although I would not expect serious spawning to commence until well into May, now is the time to take stock of the toll of Winter, make appropriate reparations and begin preparations for the breeding season ahead.

Once the worst of the snow has disappeared one of the most important tasks is to 'Spring clean' the ponds. This should not be too great a task as the job will have been done last Autumn... won't it?

If you did—full marks. All you need to do is carefully transfer fish and plants into tanks or other containers before emptying the pond completely. Along with the waste water will go any liquid waste matter from the fish together with decayed leaves, mulm, etc.

Once the pond is empty, a quick scrub over with the help of a dustpan and brush (regular readers to 'Coldwater Jottings' will know that these can be surprisingly handy items) and the pond can be refilled before returning the fish and plants.

Those of you who 'didn't quite get round' to cleaning the pond before Winter may well have encountered some difficulties with their fish—especially during the severe cold in January.

As a result of toxic gases, caused by decaying vegetation and mulm, being trapped beneath the surface layer of ice, oxygen will have been in short supply—causing stress to fish at very least and death at worst.

If this has happened to you, it is an experience you will not want to repeat—especially if it is your most prized fish which has gone to that great pond in the sky.

As I have often said, fishkeeping is mainly a matter of common sense. With a little attention a great deal of pleasure is to be gained. So this year's 'golden rule'

should be to ensure that all those jobs are attended to *before* it is too late (and, I must confess, I am no exception...!).

If your pond has developed a leak over the Winter break this will need to be repaired before refilling. Daft as it may sound, a number of people decide that they can 'get away' with ignoring the fault for just another year—only to find that they are forever topping-up, and twelve months later the pond has to be completely rebuilt because of the damage caused.

A swift repair now will save all that aggravation. If you have a concrete pond which has cracked, this can be lined with butyl or heavy gauge polythene. Butyl-lined ponds rarely need repair, but repair kits are easily available, while I carry out running repairs to my own polythene-lined ponds by means of agricultural tape. The only problem with this is that the tape is silver in colour while the liner is black! However, the ponds lined with polythene are strictly functional as they are used for rearing fry, so I am not at all worried about appearances.

## Join a Society

One of the most pleasurable aspects of keeping fish is sharing tips and tales of success (and failure!) with fellow aquarists. There are a vast number of societies throughout the country which cater for the interests of fishkeepers of all persuasions. For those of us with a coldwater interest, specialist coldwater societies throughout provide a valuable insight into the hobby.

The majority of these societies are well-established and organised on a very friendly basis. As well as providing a valuable opportunity to mix with both seasoned and novice fishkeepers, societies hold a number of activities throughout the year such as talks, table shows and, in some cases, annual open shows.

The auction of fish is for many the highlight of meetings, and is the perfect opportunity to obtain good quality fish from established strains—many an expert breeder has started from such a pair. Although not of show quality, fish obtained from society auctions will more than likely be disease-free and certainly from good breeding stock. The beginner will usually obtain fairly good results from their very first spawnings, as the strain will have been developed after a great deal of patience over several years.

Some coldwater societies will, naturally, tend towards goldfish or Koi keeping; but do not be put off as a great many keepers of such fish are interested in most forms of coldwater aquatic life—including, surprisingly, frogs, newts and plants—and a great store of knowledge can be gleaned from members. Also, there can

be no better source of information on pond construction and filtration than a Koi society!

Koi enthusiasts, too, have a number of associations which specialise in their side of the hobby. One of the highlights of the Koi-keeper's year is undoubtedly the Koi festival usually held outdoors and open to the public.

The fish themselves are displayed in large vats or even paddling pools, and the climax of such festivals is the awards ceremony, when trophies almost as magnificent as the Koi themselves are awarded.

Most of the specialist coldwater societies around the country are listed below. Whether you have a goldfish in a bowl(!), a small pond or a full-blown breeding establishment, you will gain a great deal from your hobby by becoming a member. Subscription rates are on the whole fairly reasonable, and you can obtain details by contacting the society's secretary.

### Association of Midland Goldfish Keepers

Secretary: Miss P. Ratcliffe, 'Kingyo', 112 Gorseston Road, Birmingham B14 4NP.

### BKA Fife Group

Secretary: Mr. A. Robertson, 59 Paul Street, Lochgelly, Fife.

### BKA Scottish Group

Secretary: Mrs. Frew, 77 New Edinburgh Road, Uddingston, Glasgow.

### Bristol Aquarists' Society

Secretary: Mr. V. Cole, 174 Bath Road, Longwell Green, Bristol.

### British Koi Keepers Society

Secretary: Mr. W. D. Bookless, 27 Whitwell Road, Bristol BS14 9DP.

### Goldfish Society of Great Britain

Secretary: Roger S. Saltrick, 38 Herent Drive, Clay Hall, Ilford, Essex.

### Midland Koi Association

Membership Secretary: Mrs. Joyce Hewitt, 1 Durham Crescent, Allesley Village, Coventry CV5 9GR.

### Northern Goldfish and Pondkeepers Society

Secretary: Mrs. P. Hodgkinson, 9 Stratford Close, Farnworth, Bolton, Lancs.

### Northumbria Coldwater Fish and Pondkeepers Society

Secretary: Mr. H. Kennard, 22 West Park, Morpeth, Northumberland NE21 2JP.

### South Park Aquatic Study Society

Secretary: Mrs. M. Dudley, 163 South Park Road, Wimbledon, London SW19 8RX.

(Source: The Fishkeeping Yearbook 1986—John Dawes.)

Apologies for any I have inadvertently missed. I would be pleased to receive from secretaries details of all coldwater societies and activities, for publication in this column.

C O L D W A T E R

# SIX OF THE BEST GOLDFISH

The coldwater side of the hobby is enjoying an upsurge in popularity and Goldfish varieties figure largely in this resurgence. Stephen Smith makes a selection of his favourites



LAURENCE E. PERKINS



Above: Lionhead. This popular variety of goldfish is certainly top of my list of favourites—for its character as much as its looks. Although only a young fish, this 'Ranchu' is already showing a hood development, and the male tubercles can be seen on the leading edge of the pectoral fins.

Left: The common goldfish (*Carassius auratus*) is one of the most hardy of coldwater species often surviving hideous neglect.

Below: Chocolate oranda. The hood has not yet developed on this young fish, but already the nodules are beginning to become apparent at the top of the head. Eventually the hood will develop also around the eyes and on the gill covers.



The present decade has seen the re-emergence of coldwater fish-keeping as a popular hobby. This resurgence of popularity is reflected in no small way by the continuous attraction of the Goldfish to novices and seasoned aquarists alike. Goldfish are the perfect pet to add grace, beauty and elegance to any indoor or outdoor aquatic setting.

The Goldfish (*Carassius auratus*) is one of the most hardy coldwater species: it is testimony to its hardiness that the traditional Goldfish has managed to survive even the most hideous neglect, and in accommodation which has often hardly been worthy of the fine heritage of the fish. Some of the fancy varieties, however, do require a little more care in order that they do not suffer damage and consequent disease. Contrary to popular opinion, though, even the fancy varieties will withstand all but the harshest of winters outdoors—as many breeders will testify. But it is as an aquarium fish that the Goldfish is in its element. The round-bodied varieties are ideal for viewing from the side—from which angle flowing fins and jewel-like colouring can be best appreciated.

Before I describe some of my favourite Goldfish, the newcomer to the hobby will appreciate a brief explanation of the different scale types which Goldfish display. These are: metallic, matt, and nacreous.

**Metallic:** Metallic scales are instantly recognised by their mirror-like quality. Colouring may be red, orange, yellow or silver; either all-over or in patches. Young metallic Goldfish usually appear olive in colour, but this recedes towards the dorsal region as the fish matures and takes on its eventual colouring. This would explain the fact that the black dorsal margin—often the attraction of some purchasers—eventually disappears, much to the disappointment of many young owners.

**Matt:** No reflective characteristics are shown in the scales of matt fish, which usually appear a pink transparent colour. **Nacreous:** Nacreous fish are sometimes referred to as "calico" and this is occasionally the source of some confusion. Goldfish of this scale type have a number of colours and sometimes a mixture of matt and metallic scales.

### Fancy Goldfish

There are scores of recognised varieties of fancy Goldfish. The better types are the results of selective breeding by Goldfish enthusiasts over several years—it can take a lifetime to perfect a particular strain.

Unfortunately, some obscure and rather bizarre mutations have surfaced over recent years. These are very much frowned upon by serious Goldfish keepers, who are aware that it is all too easy to produce deformed fish from any spawning, while it takes skill and dedication on the part of the breeder to select and perfect a strain.

The following examples are my personal favourites—and are probably the most popular strains of Goldfish available. They have been around for many years, but although their strains have become well-established they nevertheless represent a joy to behold and a perpetual challenge to the breeder.

#### The Lionhead

This Goldfish must come first on my list. I have never come across a fish with so much character. Despite its small finnage the Lionhead is certainly the "bully" of any mixed aquarium or pond: my own Lionheads have been seen pushing even Shubunkins aside to get at that drowning fly or beetle!

There are two recognised types of Lionhead: the Western type and the Japanese "Ranchu". Both types are metallic-scaled and prized for their main characteristic—a soft, fleshy, strawberry-like growth or "hood" across the top of the head, around the eyes and on the gill-covers. In mature Lionheads this hood is well developed and show-winning specimens have the nodules evenly formed.

The fins of the Lionhead are quite short and rounded. The caudal fin should be part-divided into two pairs of lobes, while the anal fins should be paired and completely separate. There is no dorsal fin on the Lionhead, which should show a completely smooth back with no signs of bumps or spines. Apart from

the hood, this characteristic presents quite a challenge to breeders, as the perfect "back" is usually very difficult to achieve.

The difference between the Western type Lionhead and the "Ranchu" is the curvature of the back. The back of the Ranchu tends to curve in a sudden downwards dip at the root of the tail—the caudal peduncle—with the top rays of the caudal fin emerging at an almost perfect ninety degrees to the caudal peduncle. On the Western type, however, the back shows a more even horizontal curve from the head to the tail.

#### The Moor

In vivid contrast to the short-finned Lionhead, the "regal" Moor shows an abundance of fins and is immediately recognised by its two main characteristics: an all-over matt-black coloration and a pair of protruding "telescope" eyes.

The fins of the Moor are similar to those of the Veiltail. The dorsal fin is held high while the graceful paired caudal fin should fall from the caudal peduncle in a graceful curve; while the ends of the tail should be "square-cut" (some Moors, however, may be fantailed and this is quite acceptable except for most show standards). The ventral and pectoral fins are also well developed and pointed, as are the anal fins, which are paired and completely separated as in all rounded-bodied Gold-

fish.

The colouring of the Moor presents quite a challenge to the breeder as it is extremely difficult to consistently produce Moors with an all-over black colouring: it is quite usual, though undesirable, for the enthusiast, to see a brassy or even white margin running under the belly of the fish from the gills to the tail.

#### Chocolate Oranda and Oranda types

I have picked out the Chocolate Oranda from the rest of the Oranda types partly because of the fascination which I have so often seen expressed by women for this particular type.

In common with all the Orandas, this relatively new Goldfish strain exhibits the fleshy "hood" growth of the Lionhead. Its name is derived from the beautiful chocolate-coloured metallic scales. But unlike the standard Oranda—which has the flowing fins described for the Moor—the Chocolate Oranda is a fantailed Goldfish. (Finnage of the Fantail is described in the next section.) Indeed, show standards for all the Oranda types—except for the gold-coloured Oranda itself and its calico derivative—indicate that they should be fantailed. Popular Oranda strains also include the Redcap, which is a metallic pink in colour and has its hood development only on a scarlet red patch at the top of the head;

Bristol Shubunkins displaying colours and finnage characteristics which won it first award at Bristol Aquarists Society Show in 1985



VIC CAPALDI

and the recently developed Blue Oranda, which has highly-metallic silvery-blue scales.

#### Calico Fantail

Being one of the more "common" varieties of Goldfish, the Fantail is, I feel, very much taken for granted, but I have over the years gained a great deal of pleasure from the powerful colouring and form of the calico variety.

The finnage of the fantail (referred to in the previous sections on Moors and Orandas) is in my opinion the perfect balance for the round body of the fancy varieties of Goldfish. The dorsal fin should not be so developed as to stand as high as the Veiltail, while the ventral, pectoral and anal fins are shorter and more rounded. The main difference is, of course, in the caudal fin, which is paired and held at its full extent from the caudal peduncle. Unlike the Veiltail, the lobes

of the caudal fin are clearly apparent so that the caudal fin as a whole describes two rounded bold "V" shapes. The calico colouring of my personal favourite fantail variety provides a "jewelled" appearance to any coldwater setting.

The ideal background colour for the myriad of individual scale colourings is a light blue, while the body and fins of the fish should be evenly speckled with black. As a whole, the Calico Fantail has a number of metallic scales dotted around the fish like coloured pieces of mirror-glass, but some people prefer no metallic scales at all.

#### The Common Goldfish

Many a fishkeeper has been introduced to the hobby by the acquisition of a Common Goldfish—usually at the fair-ground or from the "rag and bone" man!

A good mature Common Goldfish is a powerful sight for any aquarist. Being

of a cigar-shaped body it is in my opinion better at home in the pond, although the Common Goldfish is a fine aquarium fish and, of course, many spend their lives being peered at through a spherical glass torture chamber.

The scales of the Common Goldfish are bright metallic and ideally should be coloured blood-orange all over. Yellow and silver Goldfish are often found, while red and white varieties are popular.

Closely resembling their ancestors of the rivers and streams of China, the "Common" is a long-bodied singletailed fish. The depth of the body should not exceed half its length (excluding tail) and the caudal fin itself should not be too pronounced. The first rays of the dorsal fin commence approximately half way between the nose and the root of the tail, in a vertical line with the pectoral fins; while the pectoral and ventral fins are paddle-shaped. The anal fin is single and placed just rear of the vent.

#### The Shubunkin

Two distinct types of Shubunkin have emerged; the London Shubunkin and the Bristol Shubunkin, and it is in their finnage that they differ.

The London Shubunkin is basically a calico version of the Common Goldfish, while the Bristol Shubunkin presents a different proposition. Although the body shape is similar to the Common Goldfish, finnage is rather more pronounced—especially the caudal fin. This has been developed by careful line-breeding to a long single fin with large rounded lobes. Such is the skill of dedicated breeders that the top rays of the caudal fin stand quite erect from the caudal peduncle so that the shape of the fin is perfectly displayed without any folding between each lobe.

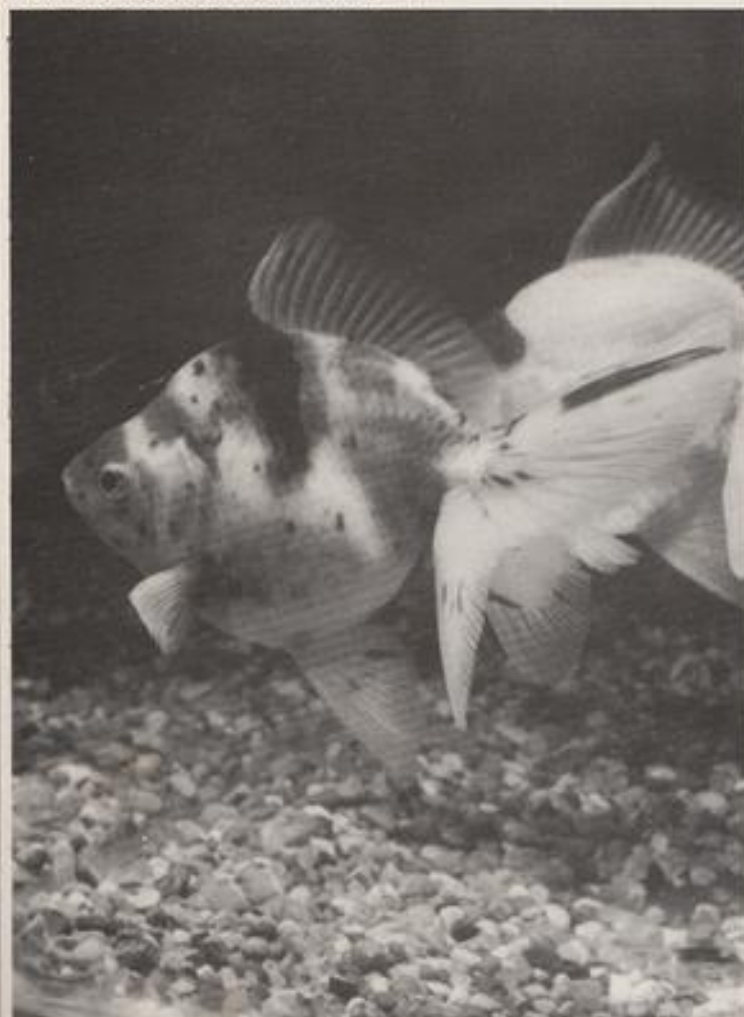
Colouring of the Bristol Shubunkin is also the subject of much attention by breeders. Ideally, patches of red, orange, yellow and brown should be placed evenly over a light blue background, with black speckles evenly dotted over the body and fins of the fish.

Perfectly scaled Bristol Shubunkins should show no reflective tissue whatsoever on scales of gill-covers.

I should point out that the foregoing descriptions are virtually show standards and fish of such quality are highly prize by their owners. However, they do serve as a useful guide in identifying some of the popular types of Goldfish and in assessing them for purchase.

As I stated at the beginning of this article, there are scores of Goldfish varieties available, so choosing "six of the best" is an extremely difficult task. Those I have outlined are some of the most popular varieties available and will be easily recognised by most people who have ever seen a Goldfish. There is always room for some of the newer varieties finding popularity such as the Bubble-eye, Celestial, Tosakin and Pearl-scale; as well as the "old faithfuls" such as the Comet and Veiltail.

Calico fantail. This young fish shows perfectly the finnage of the fantailed varieties of goldfish. The colouring of the fish is spoilt by the black stripe below the dorsal fin: the black should be speckled evenly over the body and fins



STEPHEN SMITH

Spotlight

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# THE ORANGE WRECKFISH





# THE ORANGE WRECKFISH

A common fish, one of the Sea bass which is found throughout the Indo Pacific region, this shoaling species is not too easy

**A**nthias squamipinnis is a small shoaling fish which may be found throughout the Indo-Pacific area, from the East coast of Africa and the Red Sea, through the Indian Ocean, on the Australian Great Barrier Reef, to the Philippines. It is a very common fish which seems to be always heavily featured in most under-water nature films, swimming in massive shoals above the coral reefs, at all depths from 20-750 feet. It is the only Anthias species usually referred to in most aquaria books, though there do exist three or four other less well documented species.

Glancing through books, it has an unusual variety of given common names—Orange Sea Perch, Lyretail Cod, Lyretail Coralfish, and Butterfly Perch are all featured, and a few weeks ago I even saw it called the Marine Goldfish, but I have always known the fish as the Orange Wreck Fish, and this is its usual appellation in most shops. It is, in fact, a Sea Bass, a Serranid, and is related to Groupers, Snappers and Grammas etc., but it shares none of its relatives' predatory habits and is a gentle, shy, peaceful fish, and as mentioned earlier, very much a shoaling fish rather than a loner as would be more usual for its kind.

It is a slightly anomalous fish to keep in an aquarium. It is plentiful in the wild, and thus is quite often seen offered for sale, and is usually comparatively inexpensive. However, it is one of the few marine fish which are not only better in shoals, but will invariably fail in captivity if kept singly. It is almost impossible to tempt a single specimen to feed, and after a few days the solitary fish invariably succumbs to either disease or infection, and quickly passes away. The hapless purchaser then returns to the shop to complain, only to be confronted by a tank

to keep in aquaria  
says Dave Keeley

full of the same lot of fish in apparent perfect health. It is probable that only a small percentage of the Wreckfish ever survive captivity because of aquarists' ignorance; but if one does own a tank sufficiently roomy to contain four to six of the fish, then the rewards are there to be had. And since the Wreckfish never grow above four inches, and usually less in captivity, then at least they will not threaten to overtake an aquarium with their bulk.

However, even in ideal conditions, the Orange Wreckfish are not classified as beginner's fish, since they are particular feeders. They have very small mouths and need to be fed little morsels frequently, another fact which separates these fish from Groupers and the like. In the wild they feed on countless small crustacea, and in the aquarium an ideal starter would be live *artemia*. Thereafter it is often necessary to fool the fish by introducing 'dead' foods into a water flow in order that the fish believes the cockle, mussel, plankton etc to be alive.

Since Wreckfish are normally free swimming shoaling fish, it is necessary to house them in a largish tank with plenty of open spaces, but it is also important to furnish the tank with caves or the like, since they feel the need to rest vertically at night. It is only by trying to recreate natural conditions for such 'difficult' fish as these that the home aquarist can genuinely say that he has done his best to justify taking them from the reef.

Every photograph of these fish seems to show them in a different colour, and in the past this one fish has been wrongly identified as two or three different species, so great are the colour differences. It

can be pure yellow, or orange and gold on the one hand, or a range of crimson to buff colours on the other. Normally speaking all natural photographs show only one colour species in the same shoal, but it does not seem likely that geography alone is responsible for the colour differences. The colours of the Wreckfish also seem to be affected by their diet, their immediate habitat, their sex and perhaps, most importantly, by their size and stage of development.

Nearly all the species offered for sale are apparently females, the Wreckfish being one of the small number of marine fish whose sex is easily determinable. Similarly to the Mandarin Goby, the male Wreckfish has an extended third dorsal ray when adult, and is usually more colourful. Whereas females are usually of the lighter colours, the males display all manner of assorted rich colourations. As with many other species, Wreckfish go through sex changes, young fish always being female, and males developing from them as the need arises. Experiments have been conducted where one or more males have been removed from a shoal, and invariably an equal number of females, always the larger of the remainder, have changed into males and replaced their missing numbers.

Finally, *Anthias squamipinnis* have hardly ever been spawned in aquaria, and only then when in shoals of hundreds, and have never been raised in captivity. There are quite a few reportings of their wild mating habits, and these seem to vary according to their geographical location, so I think it can truly be said that there is still a lot to be learned about these 'common' but mysterious fish.

**References:** Reproduction in Reef Fishes, by Dr. R. E. Thresher, Marine Tropical Aquarium guide, by Frank de Graaf.

# MARINE REPORT URGES REEF COLLECTING RULES

**A** report sponsored by two major conservation bodies has called for new rules to control the collection of fish and invertebrates from coral reefs.

The World Wildlife Fund UK and the Fauna and Flora Preservation Society backed research undertaken for the Marine Conservation Society by marine biologist, lecturer and author of the well respected *Coral of the World* Dr. Elizabeth Wood into commercial collection of coral reef species.

The report—called *The Exploitation of Coral Reef Fishes for the Aquarium Trade*—says it is impossible to establish an accurate picture of the trade in Britain because Customs and Excise import statistics do not distinguish between fish, corals and invertebrates. But Dr. Wood says the import value of world trade in ornamental marine fish and invertebrates is estimated at US\$24-30m a year. Britain, she says, probably takes between 2.2 and 3.7% of the world market, with an import value of about £750,000. That's about 13% by value of total imports of ornamental aquarium species.

Dr. Wood makes it clear that she is not against collection of coral reef fish. But she does stress the need for properly administered management and monitoring of resources and for a long-term research programme into the effects of both collection practices and natural occurrences on wild coral reef populations.

"With marine fish there is concern about over-exploitation of reef fish at a local level, both of endemic species and those with a widespread distribution," she says. "There are other threats caused by fish collecting which call for the trade to be monitored more effectively, especially in view of the lack of data on individual species".

The report says about 10% of fish never survive the flight to the UK from the tropics, and a further 5% die in warehouses or shops. And an admittedly limited survey, involving 20 fishkeepers,



showed that half the imported fish had died within six months of arrival in Britain.

Dr. Wood points out that there is no universally accepted procedure for holding and quarantining consignments of marine aquarium species.

And she recommends:

- New rules banning the collection of marine fish and invertebrates during the breeding season.
- Collecting quotas on rare species.
- Licences for importers, exporters, wholesalers and retailers requiring accurate record-keeping of fish collected/received and sold.
- The establishment of protected areas on coral reefs to act as 'reservoirs' for the recruitment of new stocks.
- More research programmes into the captive breeding of coral reef species.
- The listing of particularly vulnerable species in the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- A ban on imports into the European Community of species that are either impossible or extremely difficult to keep in captivity.
- Continued consultation between the International Air Transport Association (IATA) and the pet trade to promote careful and speedy handling of consignments of aquarium fish.

Sir Peter Scott, founder-chairman of the World Wildlife Fund, welcomed the report. "There has been an urgent need to study the issue of the exploitation of coral reef fishes for the aquarium trade for some time", he said. "We need to know whether the trade is in fact threatening the stocks of these fascinating and beautiful fish and, if so, what measures need to be taken, and this report is a very valuable first step in answering these questions".

The report is available from  
The Marine Conservation Society,  
4 Gloucester Road, Ross-on-Wye,  
Herefordshire HR9 5BO.  
Price: £5.00, plus £1.00 p. & p.

PHOTOGRAPH COURTESY OF THE CORAL WORLD, ELAT, ISRAEL

## Aquarist and Pondkeeper says

Snippets of information about Dr Wood's report have been filtering through to the hobby over the past few months and have given rise to widely different impressions. One of this month's writers to 'What's your opinion', for example, is troubled about its possible findings.

Every aquarist takes on a tremendous responsibility every time he or she introduces fish into an aquarium. Happily, the fact that so many fish and other aquatic organisms thrive and reproduce in captivity is living proof that it is possible to tackle our responsibilities with considerable success.

In the protected environment of a well-maintained aquarium, some fish can even find the sort of refuge that nature itself cannot provide. When this happens, it can sometimes result in fish actually living longer in captivity than in the wild. Mosquito Fish (*Gambusia affinis*), for example, only live for about one year in nature. Three- and four-year-old specimens are, however, not uncommon in aquaria.

Not every fish that is kept in captivity will eventually die of old age, though. Some will meet a premature death despite the best intentions of the aquarist. Accidents, predation, fighting, disease and mismanagement all take their toll.

Since these same factors, and others, e.g. emigration, also exert an influence on wild populations, it is quite impossible, at the moment, to say exactly how survival/mortality rates in aquaria compare with those in natural environments.

Barring human intervention, a balanced community will remain relatively so in the wild as long as each reproductively active pair of organisms can replace itself during its active life. This means that a pair of, say, Clownfish, needs to produce, in its lifetime, just one other pair that will survive to maturity and breed successfully. Anything in excess of this will lead to growth in the population while anything lower, will result in a drop.

Of the large numbers of offspring produced in nature, most will die, largely as a result of predation, disease or fighting, before they reach maturity. These losses can, however, be tolerated and rarely present major problems for the communities concerned.

Accidents, such as pollution, or mismanagement pose different questions altogether. If the former are eliminated (or kept under con-

trol) and the latter is properly administered, major disruptions and imbalances can be avoided. The opposite is, of course, equally true.

One way of avoiding problems (and already adopted with freshwater species) is the implementation of large-scale commercial breeding programmes. These have been so successful that over 90% of all freshwater fish kept by hobbyists are now believed to be bred specifically for the purpose. Although a few similar marine schemes are also under way, it is fair to say that they still lag a long way behind the freshwater ones. Still, a start has been made. Let us hope that the more complex techniques required for successful commercial breeding of marine organisms will soon be mastered and that it will not be too long before we can obtain commercially-bred marine Angels with the same ease that we can now buy their freshwater equivalents.

We, at the *Aquarist & Pondkeeper*, have always been ardent supporters of good aquatic practice in all its forms. Proper care and respect for fish and other aquatic organisms have, therefore, always been afforded space in our columns. Our writers repeatedly press these issues in their features and we, for our part, encourage them to do so. Consequently, quarantine, adequate handling, correct maintenance, control of diseases and all other topics which represent a caring, respectful, positive approach to the maintenance of organisms in aquaria, are regularly featured in our magazine.

Over the years, it has been gratifying to discover that these very same issues are heartily supported by our readers, other hobbyists, aquatic societies and federations, leading members of the aquatic trade and conservation bodies alike.

That is why we have invited comment on Dr Wood's report from two leading organisations, Ornamental Fish International and the British Marine Aquarists' Association, and have included their contributions in full. There are, not surprisingly, differences in emphasis, but there are also substantial areas of agreement.

We hope that the existence of common ground will lead to further co-operation between the organisations concerned and the eventual formulation of mutually agreed and acceptable guidelines from which all parties (including, of course, the organisms themselves) will benefit.

"...World trade in ornamental marine fish and invertebrates is estimated at US\$24.30 million a year."

## COMMENT

### Ornamental Fish International

Having received a copy of the report *Exploitation of Coral Reef Fishes for the Aquarium Trade*, I was extremely disappointed at the provocative title. As a contributor to the research carried out by Dr. Wood, I was assured that the report would be aimed at creating some improvements in the movement of stock, and that no attacks were to be made on the existing trade as such. The very first word of the title immediately goes a long way towards destroying any such belief.

Having said that, I have to say there are some very useful recommendations made within the report, many of which would result in considerable reductions in unnecessary loss and ultimately would bring substantial necessary improvements in standards within the industry.

What a great pity the Marine Conservation Society saw fit to use such an emotive title when there is such a great deal of meaningful, co-operative work to be done on a long-term basis to improve standards and help achieve our common goals.

It has to be acknowledged that conservation and concern should be paramount in all our minds.

In order to achieve a reasonable balance between conservation and collection, it is essential to ascertain an accurate comparison, one which

considers how many of the fish that died within the first six months would have actually survived in their natural environment for the same period. One thing is quite clear it would not have been 100%.

Fish die naturally; they are also part of a food chain for ever-increasing larger fish and consequently many do get consumed; some die from fighting with each other, some die from inshore pollution, certain species are caught by local fishermen for human food and, what's more, some do actually die from old age.

So please, if we are going to offer a sensible study, let's take a really wide view of the facts and not just a one-sided set of figures to make a case look good.

To draw any serious conclusions, all the foregoing facts must also be considered.

The assumption that 51% of all marine fish imported will die within six months is an alarming figure. But would these fish have survived if left to nature and their own environment? One cannot accept such a claim as being totally the result of collecting.

Far more information is needed on the expected life cycle of all the

different marine fish species within their own natural environment. Taking all these facts into full consideration, a bench mark figure could then be established from which to draw accurate conclusions. Furthermore, accurate monitoring could then be introduced to establish what improvements were being made by the parties involved.



The logo of Ornamental Fish International

Such research work would be viewed, I am sure, as a major contribution to improving the lot of coral fish in the Aquarium trade, and one which the Marine Conservation Society should be prepared to undertake immediately as a beneficial, necessary information project of significant value to all

fishkeeping hobbyists.

May I conclude by saying that Ornamental Fish International, which I represent, is the largest grouping in the world of ornamental fish importers and exporters and it has been our aim for many years to ensure the health and welfare of all fish for which we are responsible. Indeed, OFI has introduced a code of practice for the handling of fish which we ask our members to adhere to.

The primary problem period with all imported fish is immediately they are transferred from their freight boxes to the fish house. Apart from several strict regulations on the handling of fish, we insist, as an organisation, that all fish undergo a quarantine period of at least five days, the purpose of which is to reduce the stress factor as quickly as possible and the risk of disease to an absolute minimum.

It is practical action of this nature that will benefit marine fish and, indeed, all species. Misplaced words only tend to confuse.

Keith Barraclough, President.  
Ornamental Fish International,  
PR Secretariat, 4th Floor,  
Onslow House, 60-66 Saffron Hill,  
London E.C.1.

## COMMENT

### British Marine Aquarists' Association

For some time now, the British Marine Aquarists' Association has been concerned about the conservation of the world's coral reefs and the status of our hobby. Because of this, we welcome the report by Dr. Wood as being fair from all points of view and containing proposals which would go a long way towards the trade becoming more professional and the reefs still being around for our children to enjoy. I saw Dr. Wood at the Marine Conservation Society's conference in November 1985, when she gave a talk, with slides, based on her report. Given such an environment, she could have been forgiven for really going to town with wild accusations and totally unrealistic proposals. Happily, her talk was, like the report itself, merely a true picture of the trade in marine animals as she saw it.

The aquatic hobby and conser-

vation may, on the face of it, seem poles apart but there is no reason why the two cannot be reconciled—to work together to the benefit of all concerned. We don't see anything fundamentally wrong with harvesting the reefs on a sensible, controlled basis. After all, man has been harvesting the sea since the year dot and, compared to the food fish industry, the aquarium trade is tiny. Compared to the numbers slaughtered for the trinket trade,



The logo of the British Marine Aquarists' Association

the number of invertebrates caught for the aquarium is minuscule. Habitat destruction has to be a far more serious consideration. A lot could be achieved in this direction by education and control of divers

and exporters.

The report calls for more control within the trade, including licensing and monitoring and this has to be the way forward. Personally, I would love to see all imports come in via a licensed, trained, professional wholesaler where they would spend at least two weeks before they went to the retailer. Happily, this sort of wholesaler exists now but there is a very 'grey' area of marine fish importing, with all sorts of corners being cut in the name of profit. I would like to see Ornamental Fish International being more heavily promoted, with the aquarist being encouraged to buy from people within the organisation.

Finally, we feel that a lot can be achieved through education. Hobbyist organisations, like the BMAA through their magazine *Marisem*, make an immense contribution towards teaching people more about caring for their fishes, the dangers of overfishing, the scourge of Sodium Cyanide, etc., so that they become more conscientious about what they buy and from whom.

Gordon Kay, National Secretary.  
British Marine Aquarists' Association, 10 Beeches Road,  
West Bromwich, West Midlands  
B70 6QB.

# Tomorrow's aquarist

## RESULTS OF OUR FISH NAMES COMPETITION SPONSORED BY TAHITI AQUARIUMS

First of all, *Thank you T.A. Readers!* We gave you a challenge and you responded enthusiastically. Watch this space in the coming months—we'll have some more fun-filled competitions for you.

We gave you jumbled up lists of common names of various fish species and asked you to match them up with their correct 'old' and 'new' scientific names. The correct answers were:

### Under-16 Section

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

### Over-16 Section

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

### The Prizes

#### Under-16 Section

1. A 24 in. x 12 in. x 12 in. **Marina Aquarium** designed with an attractive cream-coloured moulded plastic frame and a special floating base arrangement which does away with the need to use the usual cushioning polystyrene sheet.
2. A **Marina Hood** to fit the above aquarium. **Marina Hoods** are dark brown in colour to tone in with the cream colour of the aquarium frame. The unit is totally self-contained and includes, among other features, a con-

densation barrier, push-out sections to accommodate filters, airlines and other accessories, an in-built starter and choke for a fluorescent tube, plus the tube itself.

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

**Total Value: About £65.00**

#### Over-16 Section

The prize in this older age group is as

for the Under-16's, but in the larger 36 in. x 15 in. x 12 in. size.

**Total Value: About £90.00**

The lucky winners (drawn on 11 February from the hat containing the correct entries) are:

1. **Under-16 Section:**  
**Paul Wilson**, 44 Eastdale Road, Wavertree, Liverpool.
2. **Over-16 Section:**  
**Bill Gillham**, Glebe House, Cortesmore, Oakham, Leicestershire.

## My school aquarium

by Robert Smith

"I am fourteen years old and, therefore, still attend school. Although the school building has a good public appearance, some aquarists would have walked out in disgust if they had seen our school tank the way it was.

I found out that the school had a tropical tank in a form conversation during Form Period before lunch. As I am fascinated with all sorts of fish and do some work in a fish shop (Aquadria Petit), I thought I would take a look. I wish I hadn't!

The tank, 24 x 12 x 15, was on the second floor of the Science Block. At a first look, there were no fish in it but, ten minutes later, I saw something swimming among the algae. It was a female Guppy which looked as if it were suffocating. The sides of the tank, gravel and filter box were covered in two inches of algae. I am not exaggerating. To be honest, I felt sick!

The temperature was 68°F (20°C) when I returned two days later with my siphon tube and algae scraper. At this stage, I discovered that there were two female Guppies in the tank, both trying to cry out "Help!"

I scraped the glass to get rid of most of the algae and did a 40% water change. This was, however, difficult as the algae and the gravel would not separate from each other. As the algae went up the siphon tube, the gravel was also dragged up. I discovered that holding the thermometer in the water was what looked like an old twisted coat hanger! I lifted the thermometer out of the water and an icicle-looking shape of algae was hanging from the bottom. It was so well established that it had to be literally scraped off.

The filter box was also crammed with algae—even in the air inlet tube. There was no filter fibre in it, only gravel and charcoal. I cleaned this up and put some fibre in. I replaced the well-overdue filter pad in the airpump and fitted a pigmy bulb in the hood which brightened the tank up considerably. For five weeks, 40% water changes were carried out.

Apart from being liked by the teachers for brightening up the Science Block, you get a great satisfying feeling from being able to do a worthwhile job."

For his story, Robert will shortly be receiving a Tetra Starter Kit from our Tomorrow's Aquarist Fund consisting of a Tetra Billi Filter, a copy of the Beginner's Aquarium Digest, a copy of Aquarium Digest, a Pisces Aquarium Thermometer, a Nitrite Test Kit, a bottle of Tetra AquaSafe, a tub of Tetra Staple Food (Tetra Min) and a tub of Tetra Tablet Food (Tabi Min).



Golden Nyasa Cichlid, *Melanochromis auratus*, formerly *Pseudotropheus auratus*

# Naturalist's notebook by Eric Hardy

## Adapting to temperature changes

One advantage of fish in a tank is that they do not have to adapt to seasonal changes of water temperatures met with in ponds and streams. At St. Andrews University, a National Environment Research Council grant of £51,267 is financing a 3-year work finding, how fish from the antarctic to home waters, adapt their muscles to such changes.

In freshwater fish this varies according to their habits. Carp take several weeks to adapt the mechanical properties of their muscles-fibres, doubling their contraction velocity with a decrease in energy used when the water drops from 23°C to 7°C. Cold-acclimatised carp have muscle-fibres like those of arctic fish, unable to relax completely in the warmer water. The researchers are seeking to find if this temperature modification is inherited where there is a large seasonal drop in water temperature, or merely a modification.



Antarctic icefish, *Chaenocephalus aceratus* photographed on seabed by Dr. Allan, British Antarctic Survey

In contrast, another fish ascending rivers from estuarine water, the flounder, does not alter the contractile proteins of its muscle-fibres after several months acclimatisation to either 23° or 5°C. They remain in an optimal state. They can tolerate sudden changes in body temperature.

Special techniques have been developed to measure single muscle-fibre contractions of ice-fish and marlin, using fine needles to remove their external membranes, leaving a bundle of filaments of contractile protein. The energy used in contraction is measured with liquid chromatography (absorption of dye-solutions on gelatin, etc.) and electrophoresis (movement of particles in an electrical field). Assisted by the British Antarctic Survey, they found the contraction of fast muscle-fibres in bursts of swimming surprisingly uniform among fish of similar water temperature regardless of size, shape and habits.

Most antarctic fish temperatures range between 1°C in summer and -2.2° in winter, their tissue saved from freezing by circulating glycoproteins like 'anti-freeze' in your car, and slightly high salt content of the blood-plasma.

Antarctic fish have 5 to 7 times the power output of tropical fish at zero Centigrade, but less contractile power at higher temperatures like 12°C. Carp and flounder seem to adapt after several weeks cold acclimatisation. The amount of oxygen helps crucial carp and tench adapt, surviving shortage of oxygen (stagnant water) longer at low than high temperatures. It should lead to a better understanding of how fish adapt to environmental changes.

## Freshwater Crayfish

The first book for over 100 years on our freshwater crayfish after Huxley's famous work, *The Crayfish* by Roy E. Groves, published recently by Fishing News Books at £8, is half devoted to commercial farming in brood boxes and rearing ponds with traps, etc., as at the Hampshire College of Agriculture. There is an account of reproduction, growth and diseases, but no details of its distribution here. It is certainly an informative account of this fascinating occupant of several northern limestone as well as southern chalk rivers, but not in Wales. There's an appendix on boiling, frying or smoking these crustaceans. Of course they are sometimes kept in aquaria; but these nocturnal, aggressive cannibals, if not single, need plenty of hide-holes, and food. They travel overland to new haunts. Californian signal crayfish have already been introduced to southern counties, and conservationists fear alien species could threaten our natives, though introductions are now illegal. The trade however confusingly calls marine crayfish abdomens 'crayfish tails'.

The recently published 11th Report of the Nature Conservancy Council, however, expresses concern over the increase in commercial farming with the American signal crayfish. It is a carrier of crayfish plague-fungus which was discovered in 1981 to be widespread in England's southern rivers. Native crayfish are in severe decline there and not known to have any resistance to it. As the 1980 Import of Live Fish Act postdates the first introductions, little can be done to stop its imports, part-funded by the Ministry of Ag.

Marine nature reserves are under discussion by the NCC, etc, for Scilly, Skomer (South Wales), Bardsey, Menai Straits, St Abbs (Berwick) and Loch Sween, Argyll.

## Fishkeepers' Bible

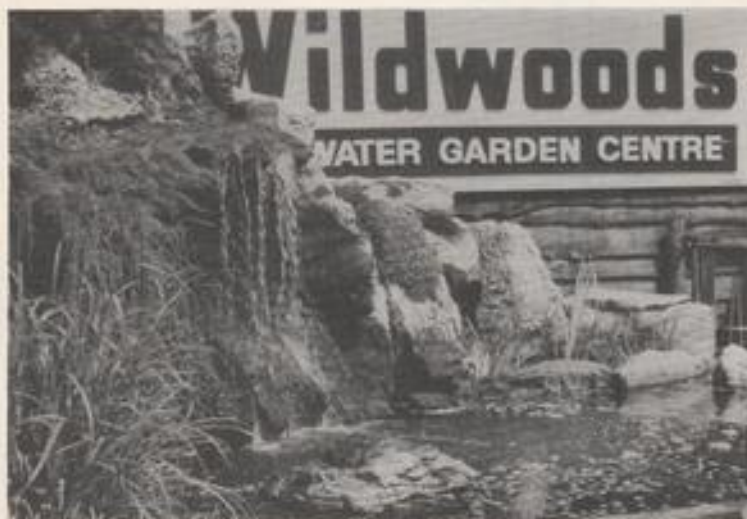
Undoubtedly the 'Bible' for the next generations of fish-keepers wishing to identify species from all corners of the earth, will be world-authority Dr Herbert Axelrod's new, 780-page *Atlas of Freshwater Aquarium Fishes*, with over 3,500 colour photos, an American work by T.P.H. Publications at £50. It should be in the library of every aquarists' club because it contains much which is not in other encyclopaedias on fishes, some of the photos being the original fish from which species were described. But the problem of condensing so much into one big volume is shown by a number of species, such as swordtails and Tilapia, having photographs but no descriptive text. Concise notes on habits and range, water and food requirements accompany clearly distinguishable photos of some 3,800 aquarists' fishes, selected from the world's 25,000 to 40,000 kinds. For convenience they are divided into the world's 6 major geographical regions.

It is largely a cradle for fascinating photographs, but 23 species of Rasbora are covered by photos and only a passing paragraph of general text. Hence the title 'Atlas'. A few photos have no information. The Australasian section portrays New Guinea Pseudomugils as 'rainbowfishes', but not 4 Australian species called 'blue-eyes', and I had to refer to Munro's Handbook of Australian Fishes for monochrome photos of these, and text of other fish. There's an introduction to identification, by finally referring to top museums, yet 3 photos on plate 112 are unnamed. Surprisingly in such a galaxy of colour, 4 plates of Synodontus are only in half-tone. But it portrays 48 goldfishes and colour carps, over 700 cichlids, 144 killifish, 80 guppies, 64 platies, 63 discus, 56 swordtails and 30 angels!

One is grateful for this New York university don becoming so friendly with amateurs. I first came across Axelrod just after the last war, writing on breeding angels, etc, in the American *All Pets* magazine. He has written, and himself published, nearly 50 books on fishes and his work commands respect. Maybe you've already got his works on catfish and breeding tropicals on your bookshelf and some of the half-dozen species named after him in your tanks. His publishing colleagues Warren Burgess (of angel fish repute), Neal Pronck and Jerry Walls combined on this book, which I well recommend. The fascinating photo of the transparent South American *Trachydoras paraguayensis*, like a living skeleton, made me want to know more about it; but there's not a mention of it beyond the picture's name!

# Company profile

## Wildwoods Water Garden Centre



Below: Part of the huge plant display/sale area with lilies in foreground and marginal plants in background



As soon as you walk through the front door, the strength of Wildwoods' claim that they can provide you with everything you are likely to require to set up a pond (or a coldwater or tropical aquarium) becomes perfectly obvious.

However, if we were to leave it at that, we would be presenting a very incomplete picture of this thriving water garden centre. Having an extremely comprehensive list of items is one thing, but backing this up with *choice* and *expert advice* is quite a different matter altogether.

The fact is that Michael Everett and his team have produced the kind of centre in which any aquarist or pond-keeper (potential or established) can lose him/herself for hours, have a thoroughly enjoyable time in so doing, see and buy an extremely varied range of fish, plants, ponds, fountains, ornaments, books, aquaria, dry goods, etc., and get any amount of good, solid advice thrown in for good measure.

Just to give you an idea of what you can expect, here is a selection of the coldwater fish that were in stock when *A & P* visited Wildwoods. Apart from numerous varieties of the more popular fish, i.e. Common and Fancy Goldfish, Koi and other well-known species, there were: Opalines or Moderlieschen (*Leuciscus delinense*), Pumpkinseeds, Sun Fish, Blue Catfish, Gold Catfish, Chinese Loaches, Stone Loaches, Golden Loaches, Bitterlings, Tanagos, Shiners, Golden Minnows (the golden form of the Fathead Minnow—*Pimephales promelas*), the wild form of the Fathead Minnow, the unusual Zacco (*Oparichthys platypus*, and even Sticklebacks. When the season really gets underway, the range is even wider and often includes Grass Carp, Silver Carp and Sterlets.

Not a bad little list—is it?

These fish are housed in rows of interlinked, aerated troughs (whose water is purified by means of Ultraviolet Sterilisers) and in a number of well-maintained all-glass aquaria. In total, there are around 200 aquaria holding, in addition

to the coldwater fish mentioned, all the more common types of tropical aquarium species and varieties, plus an impressive array of the more unusual ones, such as Fire and Spiny Eels (*Mastacembelids*), all under the watchful and caring eye of Keith Lambert. There is also a collection of American and African Cichlids for the specialist and a small, but growing section dedicated to marine invertebrates and fish.

To those who have always linked Wildwoods solely with watergardening, this may come as a bit of a surprise. Yet, there it is—a fully stocked, very well-run, tropical section that would be the envy of many a tropical specialist.

A further sign of Wildwoods' comprehensive approach to their fish can be seen in the provision of quarantine facilities. Despite the fact that the existing quarters are quite extensive, a new and bigger quarantine section was being constructed at the time of writing.

David Monk (who is responsible for managing the smooth running of the centre) has a strong interest in fish health and carries out a full preventive, diagnosis and treatment programme on all new stocks (watch out for David's articles on this subject in forthcoming issues of *A & P*). In addition, there is a diagnosis service offered to clients (but write for the relevant leaflet first).

This informative sheet is just one of several advisory publications issued by Wildwoods. The series includes titles such as: Fish Problems, Green Water, Topical Tips for Pondowners, Ice on the Garden Pond, Installation Technique for Glassfibre Ponds, Planting Tips, Setting up your Aquarium and Keeping Reptiles and Amphibians.

Moving on to plants for coldwater aquaria and ponds, Wildwoods could not wish either for a better selection of species and varieties or for a better person to take on the considerable responsibility that such an important part of a water garden centre demands. As far as the plants themselves are concerned, Wildwoods can supply any pond plant anyone is likely to want. If this cannot be done on the spot, it is usually possible to obtain the required specimens within a few days. The person primarily responsible for maintaining Wildwoods' high standards and formidable reputation in this area is Bill Heritage, whose excellent books are synonymous with watergardening at its very best. (Bill will also be contributing to *A & P* during the coldwater season. Keep a lookout for his articles over the coming months—you can't afford to miss them!).

The vast majority of pond plants available from Wildwoods are established in containers before being offered for sale. A very interesting feature about the Company's approach to pond plants is that they always have abundant stocks for sale, even during the autumn and winter months. This provides pondowners with the opportunity of introducing well-



The Penguin system can be tastefully arranged to produce a water garden effect within a quite confined space

established, 'dormant' plants into their ponds well before the normal plant-selling season gets underway. Valuable early growing time (plus good bargains) can, therefore, be gained by taking advantage of low 'close' season prices.

Moving on from the plants themselves to the ponds in and around which they are designed to go, Wildwoods offer a selection of sizes and types, from the very small to the very large, and from the informal to the formal, with every shade in between. One particular system which is exclusive to Wildwoods and deserves special mention is the Penguin Set-up which consists of a complete re-cycling unit suitable for the garden, patio or conservatory. The self-contained set

includes a Penguin Glassfibre Pond, a set of 'Rock-Finish' concrete 'kerbs' which fit onto the pond edges, a small cascade, a medium cascade and a Stuart Turner Submersible Pump—currently going at a Special Offer Price of £175.

With a little ingenuity and creative flair, the Penguin Set-up can be arranged to form a beautiful, compact, small water-garden. By incorporating multiple units into the design . . . anything is possible. Just to give people an idea of what can be done, several Penguin units have been set up and planted out as an integrated, permanent, colourful display near the front entrance at Wildwoods.

As mentioned in the opening lines to this Profile, you can find anything you are likely to need to set up a pond or aquarium from scratch at Wildwoods Water Garden Centre. The great beauty of it is that everything is housed under one roof. The spacious, well-designed layout means that you can browse at leisure without having to keep an eye on the weather and without having to go from one building to another. Wheelchair-bound aquarists and pondkeepers will also be pleased to learn that the wide aisles, plus the gentle slopes that exist between the various levels of the sales area, make every part of the building fully accessible. This is helped further by the positive approach of the whole staff. Fuller details of this aspect of Wildwoods will be dealt with by Nick Lushchan in a future edition of 'Helping Hand' (our bi-monthly page for disabled fishkeepers).

If you would like further information on the services and products available from Wildwoods, contact Michael Everett, Bill Heritage or David Monk at Wildwoods Water Garden Centre, Theobalds Park Road, Crews Hill, Enfield, Middlesex EN2 9BW. Tel: 01-366 0243.

## Next month

If you want to read the best articles by the best writers in the UK, Europe and the States, we've got just the thing for you in our April issue.

Here's a taste of what's in store:

- **Dr. Paul Loiselle** of the University of California, known to Cichlid enthusiasts the world over, takes a close look at a fascinating Rift Lake Cichlid in one of our main colour features.
  - We visit **Dr. Chris Andrews** at the London Zoo Aquarium to find out all about the running of this world-famous institution and the exciting plans they have in store for the future.
  - **Gordon Kay** and **Dave Garratt** of the British Marine Aquarists' Association present the first of their information-packed illustrated articles for beginners.
  - The myth of the Silent World is exploded by regular contributor **Dr. Michael Benjamin** in his absorbing article on Noisy Fish!
  - With articles on Killies, Catfish, Goldfish and Gouramis (to name a few), plus our ever-popular regular features, our colourful April issue is one you just cannot afford to miss.
- Book your copy NOW!



# Meet the societies



Grangemouth Aquarist Society will be celebrating its tenth anniversary in June of this year. Not bad for a Society that came into being as the result of a paragraph that appeared in the local newspaper.

This paragraph was, in effect, an announcement that a meeting was going to be held to investigate the possibility of establishing a local Aquarist Society.

Up to that point, keen aquarists from the area had had to attend the meetings of outlying Aquatic Societies if they wanted to keep up with what was happening in the hobby. By June 1976, it was felt that it was high time that Grangemouth had

## Grangemouth Aquarist Society

its very own Society. Fifteen people attended that preliminary meeting, and so, Grangemouth A.S. was born.

Once the Society had found its feet, it began to expand its range of activities. These include out-of-the-ordinary projects as well as the more 'normal' ones that one would expect from an active Society.

For example, one member was responsible for tutoring a squad of Army Cadets for their Duke of Edinburgh Award which (happily) they passed. Other members breed fish and donate them to the local Infirmary, Centres for the Disabled and local schools. Aquaria are also maintained in a Day Centre and a school. Some members have helped senior citizens and disabled aquarists to set up tanks in their homes. The Society itself is regularly being asked by 'outsiders' for advice on a whole range of fishkeeping topics and has been involved in the nursing and care of sick fish. As can be seen, G.A.S. is involved in all sorts of worthwhile undertakings.

Activities during meeting nights include a programme of lectures by local and 'national' speakers, tape and slide shows and Table Shows. When well-known speakers, such as Dr. David Foed of 'Aquarian' or Mr. M. Drummond of the

Loch of Lowes, have visited the Society, these lectures have been made open to the public and have proved extremely popular.

When Table Shows are organised on the various branches of the hobby, members compete for points which are accumulated during the year and go towards the award of the Society's coveted annual trophies.

Grangemouth A.S. meets on alternate Thursday evenings at the Youth and Community Unit, Abbot's Road, Grangemouth, at 7.00 p.m. Because of the 'alternate' arrangement, meetings can fall on the 1st and 3rd, or 2nd and 4th weeks—so check with the Secretary for the date of the next meeting if you are thinking of joining this thriving Society.

New members are always welcome at any of the Society's meetings or trips. In particular, G.A.S. is very keen to attract new women members who are currently outnumbered by men.

G.A.S. is affiliated both to the Youth and Community Unit, where the meetings are held, and to the Federation of Scottish Aquarist Societies.

**Subscription rates:** Adults, £2.50 Juniors, £1.00. (Subs. include a badge for new members).

**Apply to:** Mrs. J. Wardlaw (Secretary), 15 Portal Road, Grangemouth, Stirlingshire.



The Isle of Wight Aquarists' Society was founded in September 1951, "to encourage an interest in all branches of fishkeeping—coldwater, tropical and marine".

Once they join, members tend to remain within the Society for years—always a very good indication of the 'health' of the organisation in question. For instance, one of the Founder Members is still actively associated with the I.W.A.S. and recently gave an illustrated talk on the old days to present members.

Meetings are held twice-monthly, on the second and fourth Wednesdays from September to May inclusive, at the Unitarian Church Hall, Newport. There

is a programme of lectures, slide shows, quizzes and competitions, as well as a Bench Show for one or more Classes of fish. In addition to the trophy for the winner of each Class (a total of thirty or so), points are accumulated over the year and go towards the award of various trophies and shields at the annual Dinner and Dance.

The I.W.A.S., which is affiliated to the F.B.A.S., and the A.S.A.S., is run by an executive committee which meets once a month. Other 'official' meetings include the A.G.M. in April when all officers come up for re-election.

Outside its own 'internal' programme of activities, the I.W.A.S. makes itself responsible for the maintenance of the Public Aquarium at Puckpool Park, in Ryde, where there are 18 tanks, including two tropical marine tanks and one for local marines. Piranha, Cichlids, Terrapins, Axolotls, and an eight-foot community tank, also figure among the exhibits which attract numerous visitors during the holiday season and numerous local regulars throughout the year.

Since the Society has among its members people interested in most branches of fishkeeping (including an F.B.A.S. 'B' Judge), there is usually an expert at hand able to help with any enquiries or pro-

blems, be they general, specific, technical, or involved with the identification of unusual fish.

In 1985, for the first time in many years, the I.W.A.S. entered a tableau at the British Aquarists' Festival at Belle Vue, Manchester. A party of six members made the journey north to the Festival and were encouraged by the fact that entries in two Classes took First Prize. Further successes included a number of Seconds and Thirds.

On the social side, the Society holds a successful annual Dinner and Dance in April at which the many trophies and shields won by the members during the past twelve months are presented. Members of other Societies are always made welcome at these events, especially those from Portsmouth A.S. and Wimbledon with whom the I.W.A.S. has long-standing connections. Another event in the social calendar is an entertaining Mastermind-type competition which is held every December.

Although the I.W.A.S. is a very active Society, new members are always welcome. **Subscription rates:** Adults, £3.00; Juniors, £1.00.

**Apply to:** Mrs. J. E. Fenn (Secretary), 85 Orchard Road, Seaview, Isle-of-Wight, PO34 5JJ.

# News from the societies

## British Killifish Association

2 March—Open Show at the Toc-H Hall, situated at the end of Bonnywell Road, off the A879 in Leigh, Nr. Manchester.

## Keighley Aquarist Society

2 March—18th Open Show which will be held at the Keighley Victoria Hall Leisure Centre. Benching from 12.00 until 2.00 p.m.

## British Aquarist's Study Society

15th March 1986, 1st Spring meeting, to be held at the Park Street School, Park Street, St. Albans, Herts. 2.00 p.m. to 5.00 p.m. Video Film by Ron Forder.

## Oldham & District Aquarist Society

30 March: Oldham & D.A.S. Open Show at Wetneth Park Music Room, Frederick Street, Oldham. Benching 12-2.0 p.m. Open to the public at 2.0 p.m. Schedules and any further information from A. Chadwick at 9 Bronville Close, Chatterton, Oldham OL1 2RH.

## Wrexham Tropical Fish Society

20 April—2nd Open Show. Secretary: Peter Jones, 1 Hope Street, Caergwrle, Nr. Wrexham, Clwyd LL12 9AA.

## South East Aquarist Society

5 April Open Show at Isleworth Public Hall, South Street, Isleworth, Middx.

Further details from Show Secretary, Mrs. D. Cruickshank, 82 Stanley Avenue, Greenford, Middx. Tel: 01-578 0104.

## Sudbury Aquarists' Society

6 April: Sudbury Aquarists' Society, Annual Open Show to be held at Neasden High School, Quainton Street, Neasden, NW10. Further information and Show Schedules from B. Witteridge, 142 Joel Street, Northwood, Middlesex HA6 1NL. Tel: Northwood 24450.

## Birtley Aquarist Society

16 March—3rd Open Show at the Birtley Community Centre, Ravensworth Road, Birtley, Co. Durham.

Further information and schedules available from: Mr. D. Benson, Show Manager, Alnwick House, Durham Road, Birtley, Co. Durham. Tel: Tyneside 4109009.

## Bristol Aquarists Society

13 September—Bristol A.S. Coldwater Fish Show at St. Ambrose Church Hall, Stretford Road, Whitehall. Open to the public from 3 p.m. to 5.30 p.m. Show Schedules and further details from the Show Secretary, I. Mildon, 87 St. John's Lane, Bedminster, Bristol BS3 5AB. Tel: 0272-712383.

## Halifax Aquarist Society

23 March—Halifax A.S. Spring Auction at Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Booking in of lots 12.00 to 1.30 p.m. Auction to start at 1.30 p.m. Details ring David Shields on Halifax 42852 (day); Halifax 60116 (night).

5 October—Halifax A.S. Open Show at Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Please note Auction starts 1.30 p.m. Show 2 p.m. Schedules from David Shields, 'Cobblestones,' Gainest King Cross, Halifax HX2 7DT (s.a.e please) or ring Halifax 42852 (day) or Halifax 60116 (night).

## Torbay Aquarists Society

At the A.G.M. held on 10th December, a vote of thanks was given to everybody who helped to make the 1985 open show an overwhelming success and the premier show in the south west.

Officers elected; Chairman, Mrs Jill Beck; Hon. Secretary Mr. R. Fletcher, 115a Winner Street, Paignton. Tel: 524441. Treasurer Mr. Neville Lewis; Show Secretary Mr. Lee Stevens, 77 Howards Way, Newton Abbot. Tel: 64273.

Date for the 1986 Open Show is Sunday, 12th October, Venue Community Centre, Newton Abbot.

## Bristol Aquarists Society

The following officers have been elected for 1986: President: J. Day; Vice-president: I. Mildon; Treasurer: Mrs. I. Day; Reporting Secretary: Mrs. J. M. Thomas; Committee: V. Capaldi, W. Perkins, G. Smith, H. C. B. Thomas; Secretary: V. Cole, 174 Bath Road, Bristol BS15 6BD. Tel: 0272-322849. The Society caters for all aspects of Coldwater fish-keeping and meets on the second Tuesday of the month at St. Ambrose Church Hall, Stretford Road, Whitehall, at 7.30 p.m. Further details from the Secretary. Show date provisionally fixed for 13th September.

## Federation of British Aquatic Societies

At our A.G.M. on 7th December 1985, the following Council members were elected: President: Mr. C. A. T. Brown; Vice Presidents: Messrs. R. D. Esson, L. Littleton and Dr. C. Andrews; Secretary: Mr. C. Cheswright, I, Fairdene Road, Coulsdon, Surrey; Treasurer: Mr. T. Noronha; PRO: Mr. J. Nethersell; Publications Officer: Mr. P. Furze.

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In first instance please forward a photograph and C.V. details to:

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