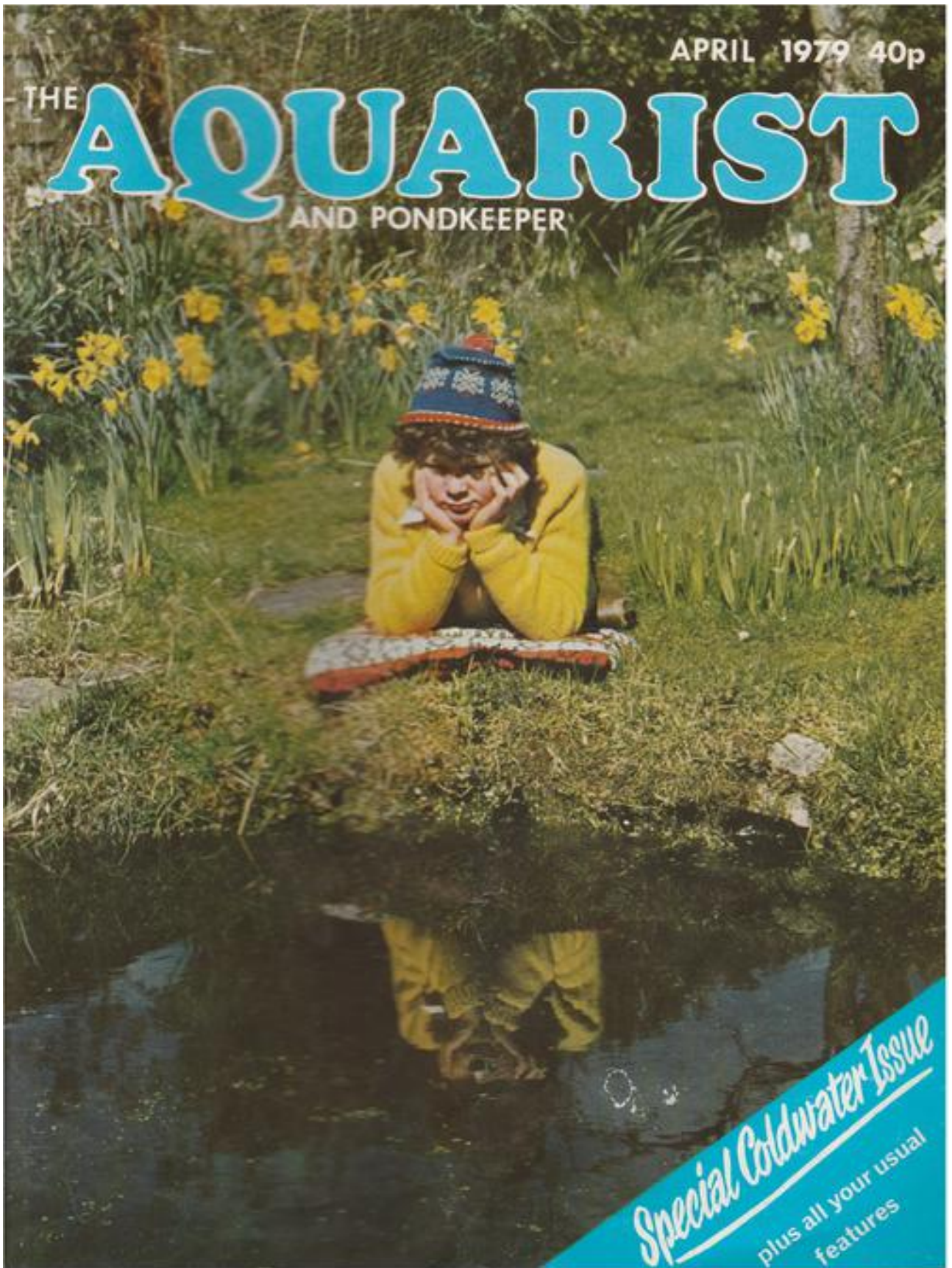


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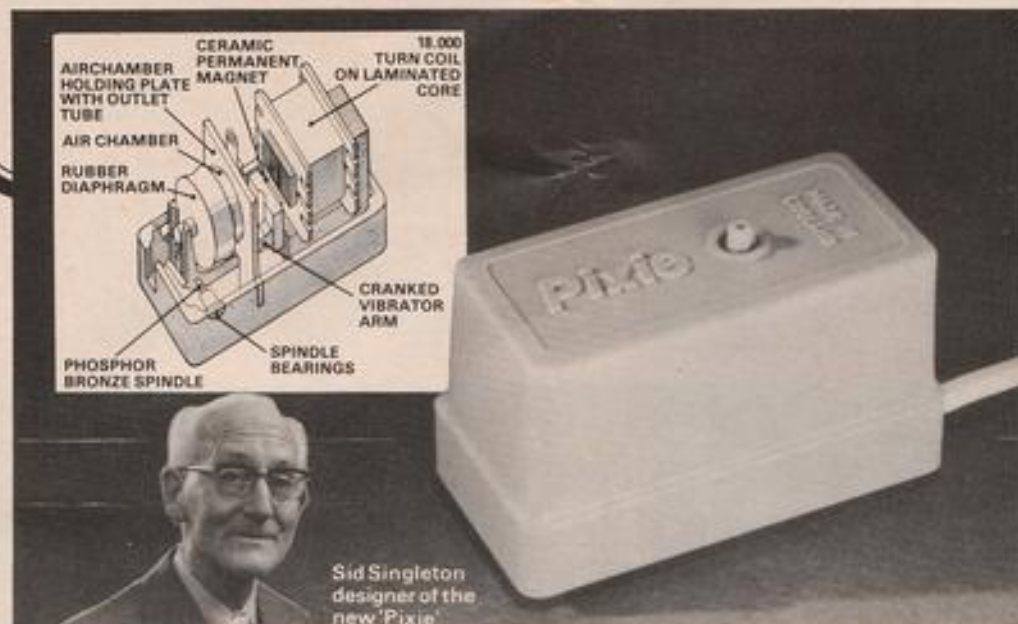
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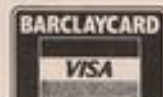
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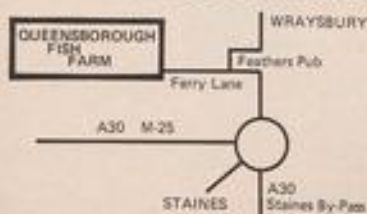
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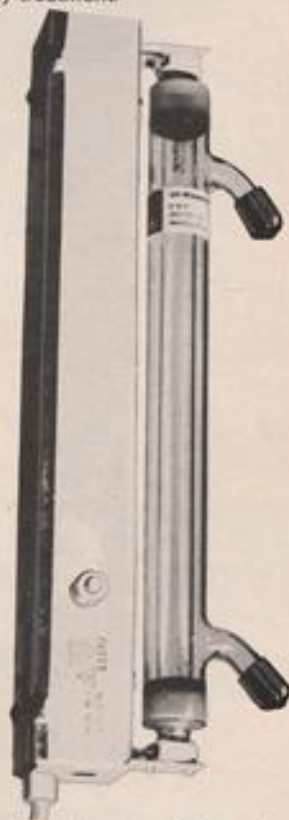
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OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE

All queries **MUST** be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

TROPICAL QUERIES

by Jack Hems

The grit in my aquarium turned black and smelly. An aquarist friend told me I had brought the condition about by overfeeding my fish (I am a beginner). If I wash the grit well can I use it in the aquarium again?

After you have washed the grit under running water place it to drain on a few sheets of newspaper spread out where it will get the cleansing benefit of sunlight, rain, and gusty winds. This should restore the colour and render it quite suitable for returning to the aquarium.

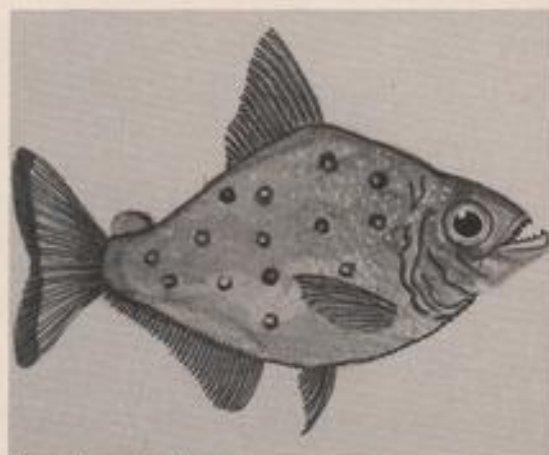
I should like to know the country of origin, scientific name, feeding and temperature requirements of the golden severum.

The golden severum is merely a colour variety of the ordinary severum or sedate cichlid (*Cichlasoma severum*). This species is native to the middle regions of the Amazon and beyond to the north-eastern corner of South America. The severum flourishes well on a mixed diet of lean meat, worms, the larger granulated or flake food, and a temperature range of about 72°F (22°C) to 77°F (25°C).

I keep angel fish, pearl gourami, dwarf gourami, blue gourami, black widow fish, harlequin fish, flying foxes, neons and glowlights in a 3 ft. tank. I have lost quite a few of the small fishes and have been puzzled by the cause, that is until a few days ago when I noticed the remains of some unfortunate glowlight tetra hanging from the mouth of an angel fish. Are angel fish given to this sort of behaviour?

In all probability the angel fish you observed with a moribund or dead glowlight in its mouth was just taking advantage of a previously chewed-into fish. I suspect the flying foxes. They can be very boisterous and snappy if very much smaller fishes are

present. Always make a point of choosing fishes (for a community tank) not likely to be looked upon as likely sport for lively chasers or seekers after small prey. Angel fish seldom molest other fishes; they are usually too busy trying to impress one another to take any notice of other species, especially species that haunt the middle and lower levels of the water. Male guppies, with flowing fins, almost always invite unwelcome attentions. They are best given a tank to themselves.



Serrasalmus rhombeus

Please give me some tips regarding the care of *Serrasalmus rhombeus*?

The black spotted or white piranha (*S. rhombeus*) grows to a length of about 9 in. and therefore should be given a tank to itself. A tank of about 36 in. by 15 in. by 12 in. is about right. It should be planted with thickets of *Vallisneria spiralis* or some leafy or long-stalked underwater plant to afford lurking

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places and shelter. The plants are best anchored in sharp sand or fine grit sloping from the rear and ends of the tank to a clear foreground. A temperature of about 75 F (24°C) is as good as any and such food as divided or whole earthworms, unwanted fish fry (large enough to whet an appetite), slivers of raw cod, fresh haddock, fresh herring, raw red meat, and the like, should be placed on the menu. (Some piranha fish are finical feeders so a wide choice of flesh items should be made available.) The aquarium should be kept well-covered with stout glass or stout plastic to prevent the fish from leaping out and upsetting the calm of a normal household.



Corydoras punctatus

Please give me the full size, country of origin and suitability of *Corydoras punctatus* for a community aquarium.

C. punctatus is said to be found only in the Suriname river system. The species reaches a length of about 2 in. and is peaceable. There is some variability of pigment markings according to the locality in which the fish prefer to collect, or live.

Do you think I should buy an air pump and filter for a tank measuring 14 in. by 7 in. by 9 in.?

The short answer is no. All you need are a sufficiency of plants, adequate toplight to grow them in, and a weekly siphoning of the bottom to remove fish and plant wastes. After cleaning operations have been carried out top up the water to its former level with mains water drawn several hours previously and then raised to the correct temperature by the addition of some boiled-up mains water poured from the kettle.

What is the difference between a mouth-brooder and a mouth-breeder?

There is no difference at all. In times past buccal incubation or the practise of carrying the eggs, and later the fry, in the mouth of the parent fish (a task usually undertaken by the female rather than the male

and sometimes indifferently by either) was commonly called mouth-breeding. Strictly speaking, and it is more sensible at any rate, the practice should be called mouth-brooding.

I am interested in the life and behaviour of piranha fishes in the wild. The aquarium books I have read treat them too sketchily. Can you recommend a book that would suit my requirements?

None better than *The Piranha Book* by Dr. George Sprague Myers. This well-documented, well-written, well-illustrated book is published by TFH Publications at £1.80. It is a work that should be included in the library of every serious fancier of tropical freshwater fishes.

I am a very junior aquarist and have just purchased a 24 in. by 15 in. by 12 in. aquarium. Please tell me what sort of fluorescent light I shall need to keep plants in proper growth and the fishes in good health.

Go in for a choke and fitting to take a 20 watt fluorescent lamp. A warm white, or its nearest equivalent, will do if you plant up with *Cryptocoryne affinis*, *C. willisii*, *Ceratopteris thalictroides*, or *Hygrophila polysperma*. Keep the lamp switched on for about 12 to 14 hours a day.



Rasbora pauciperforata

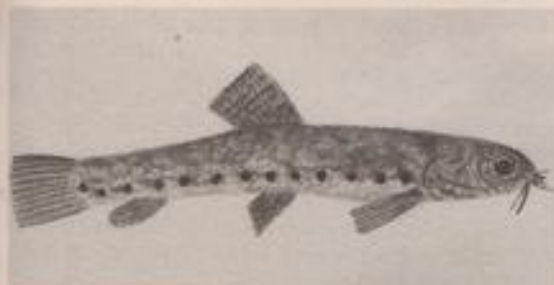
Is the red-striped rasbora suitable for a community tank?

The red-striped rasbora or *Rasbora pauciperforata* is mild-mannered, active, easy to feed on the regular live and dried foods, doesn't tear strips off the plants and, all in all, makes a most attractive addition to a community tank.

An aquarist friend gave me a lump of coal and told me that if I boiled it first no deleterious effect would be felt by my small collection of fishes. Is this true?

You need not even go so far as to boil the piece of coal. Just scrub all loose dust and flakes away and

then give it a preliminary soaking in a bucket of water. Reject the coal though if it shows metallic streaks, like veins of silver or gold or brass, on any of its exposed surfaces.



Lepidocephalus thermalis

Could you please give me some information about a fish called *Lepidocephalus thermalis*?

Lepidocephalus thermalis is a cobitid or true loach from India, especially of the eastern seaboard. It is also found in Sri Lanka. It attains a length of about 3 in. In general body shape it is not unlike the ordinary European spined loach. It is characterized by eight barbels, a dorsal fin inserted somewhat anteriorly to the ventrals, a caudal fin without lobes, small scales and a colour that is near enough to grey-green overlaid with irregular-sized and placed blotches. It thrives best in well-aerated and very clean water of no great depth. The floor of its aquarium should be carpeted with small rounded grit or non-too-abrasive sand into which it burrows and stays nearly or completely hidden for short or long periods of time. Its food is worms, small crustaceans, and tiny pieces of lean flesh, or small aquatic larvae.

My mollies are eating all the plants in my community tank. Could you advise me what to do about it?

Introduce many, many more plants, and include more domestic or garden greenfood in the mollies' diet. For example, blobs of soft-cooked spinach, turnip tops, sprouting nettles, cooked and shelled fresh garden peas, scalded lettuce. Mollies demand plenty of greenfood in their diet. In the natural state they find the right sort of algae to pasture over or the tender shoots of massed low-lying aquatic plants.

Would *Therapon jarbua* settle down all right in a freshwater tank?

T. jarbua is unlikely to die right away if introduced into freshwater, but it is essentially a fish of brackish and salt waters and it is advisable to get it used to sea

water or brackish water within the space of a week or two. It makes good company for scats, Malayan angel fish, or archer fishes. If the fish you buy is taken from a freshwater tank make the transition to salty water very gradual.

I would appreciate any information you can give me about dealing with a blanketing growth of filamentous algae.

Clear as much of the algae out of the tank as you can by winding it onto a piece of notched cane. Then introduce many more higher plants well-suited to growing in your aquarium than you have at the present time. For nothing checks the growth of some of the more obnoxious growths of algae than plenty of higher plants competing for light and nutrients in the water. Plants recommended include *Ceratopteris thalictroides*, *Hygrophila polysperma*, *Vallisneria spiralis* and any species of accommodating *Cryptocoryne*. Until the newly introduced plants create a tall curtain of greenery in the rear half of the aquarium, and at the ends, you will have to keep pulling the filamentous algae, as it spreads about, out of the tank.



Apistogramma ortmanni

What special requirements are needed by a dwarf cichlid called *Apistogramma ortmanni*?

This pygmy cichlid (it is full grown at about 2½ in.) should be quite at home in a well-planted tank kept filled with soft and peaty acid water. The temperature should be maintained in the upper seventies to low eighties (°F.) and food such as white worms, clean *Daphnia* (live), tiny pieces of raw red meat, raw white fish, baby livebearers, and the like, go down well. Narrow fissures contrived out of vertical slabs of slate, or an overturned flowerpot or two invite spawning, when the fish are ready and conditions are right.

COLDWATER QUERIES

by Arthur Boarder

I have a garden pond, 6 ft. x 3 ft. x 18 inches. In it I have nine goldfish ranging from three to five inches long. Recently one of them was killed by other fish chasing it. What can I do to prevent another happening like this?

The goldfish were spawning and the female may not have been ready to lay eggs. Where there are several male fish in a small pond the female fish could be injured. Your main trouble is that the pond is too small for the number of fish you have in it. It should not hold more than about eighteen inches of body length of fish. You may not have enough water plants in the pond. When fish are breeding it is important that there is a quantity of underwater plant life so that if a female is unduly harassed it can hide in the plants and so escape being injured. You may have too many male fish in proportion to the females. Lessen the number of fish and increase the amount of plants.

I wish to set up a tank for coldwater fishes. It is 27 x 12 x 12 inches. I do not want to have fancy goldfish and wonder if you can suggest some small coldwater fishes for the tank. I thought about a tank of Catfish. Would these be all right?

The smaller coldwater fishes are: Minnows, (*Phoxinus phoxinus*); Bitterling, (*Rhodeus amarus*), and the Stickleback, (*Gasterosteus aculeatus*). There is a small foreign fish which should suit your purpose well. This is the Japanese Rice fish, (*Oryzias latipes*) which can be kept in a tank in a living room. Although these fish like small live foods they can be given flake food which can be introduced gradually.

I do not think that Catfish would be very suitable for your tank and they could grow too large. Also they are bottom feeders and move about mostly at night. A tank of these fish is not likely to be very attractive.

How old do goldfish have to be before they can breed?

It is not the age of a fish which is likely to encourage the need for spawning, but the rate of growth and health of the fish. A goldfish which has been bred in a garden pond is not likely to breed before it is two years old. Some may not be ready until they are three. A lot will depend on the time of the year when they were hatched. This can make an enormous difference. Fry hatched in April can grow on well and by late September they can be two inches long over-all. Whereas if they were not hatched until September, they would hardly be that size by the late summer of the following year.

If goldfish are hatched and reared under warm, controlled conditions, it is possible to have the youngsters

three inches long by the end of the year. In such cases these fishes could spawn the following season. The youngest fish I have bred from were just eight months old. They were reared at a water temperature of about 70°F., and were well fed with plenty of swimming space. These fish were fantails and were quite three inches long by the end of their first year. In the following spring they spawned and produced plenty of fry.

I have read that one should have three males to each female when trying to get them to spawn. Do you agree with this please?

There is a difference here as to whether the fish are to be spawned in a pond or a tank. In a tank where swimming space can be restricted I consider that one male to a female is sufficient. More than this can cause great distress to a female fish as she is chased vigorously about the tank with nowhere to hide. Plenty of water plants in the tank will provide some shelter for a female fish which is being chased too vigorously. Remember that it is possible for a female fish to be killed by too many males worrying her especially if not ready to spawn. The number of males to a female can be two or three in the garden pond, but it must be realised that if only one female is ready to spawn, all the males in the pond can join in the chase and so cause trouble. Considering all possibilities, I think that an even number of male fish to females would be the safe stocking to adopt. The sperms from one male could fertilise the eggs of numerous females and so the fertilising of eggs either in a pond or a tank should be possible with one male to a female. In a tank the fertilisation rate could be much greater than in a pond as the sperms would have less water in which to spread out.

Last year I saw a number of eggs on the water lily leaves but never saw any young fish. The eggs were sausage-shaped lumps of jelly with tiny spots in them. Were they fish eggs?

The eggs were those of the Great Pond Snail or Freshwater Whelk, *Limnaea stagnalis*. The tiny dots you saw in the jelly were the young snails. These may be eaten when they are very young by the fishes, but when they grow they are too much for the average fish to eat. However Tench will suck them from their shells and eat them. You should not encourage too many of these snails in the pond, as they can eat fish eggs and any dried food which is thrown on the surface of the water will soon attract the snails, what food they do not eat they can foul up with their slime and so make it uneatable for the fishes.

Continued on page 30
THE AQUARIST

It may have been a long winter but

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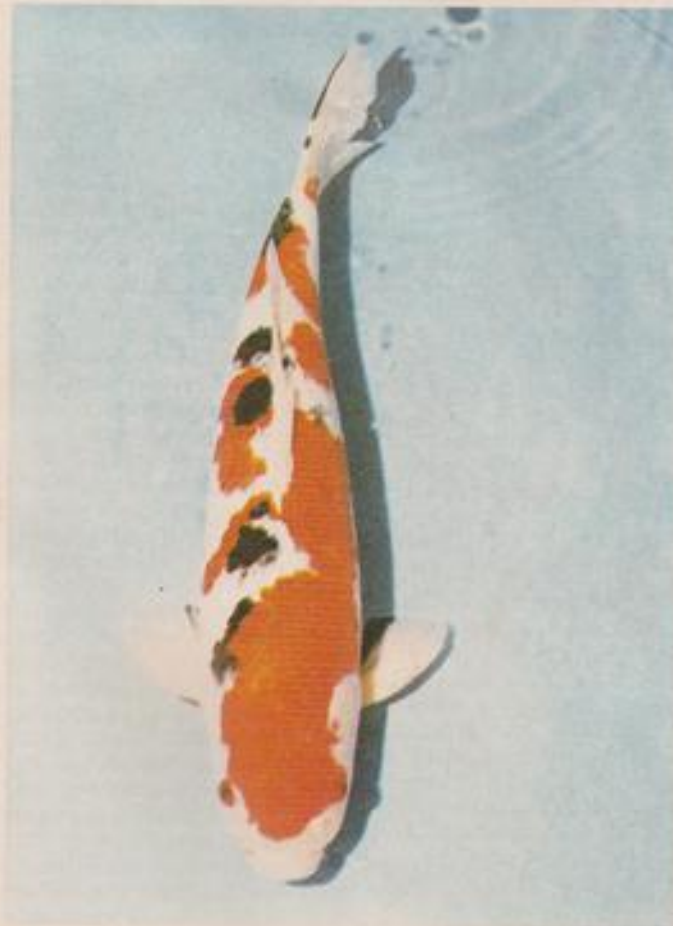
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continued from page 28

Can you recommend any fancy goldfish which are suitable for an outdoor pond throughout the winter?

In the coldest parts of the country there are very few goldfish which could be expected to stand the winter out of doors. This is not the only point to consider. There is the question of the severity of the winters. Many are fairly mild whilst others can have very low temperatures for several weeks. It is these very severe ones which can take their toll of pond fishes. It is advisable to use the more sturdy types and leave the very flowing-finned ones for the indoor tanks. For very many years I have had fantail goldfish in an outdoor pond and they have never been in trouble. However they have been the scaled variety which I always think are hardier than the calico types. Shubunkins are quite hardy; perhaps the London types are the stronger, but both types should be all right. Such fishes as Orandas and veiltails can become affected with fin-rot and eventually Fungus disease as their flowing fins are very delicate and liable to become attacked by disease.

Of course the main consideration is to ensure that the water remains in good condition throughout the winter. After a severe frost when there may have been ice covering the pond for some days, it is important to remove all ice as it thaws and then change a quantity of the water, according as to its purity. It is not the cold which harms the fishes but foul water, caused by foul gases which can be trapped under the ice. This is more possible when the pond was not cleaned out in late autumn.

I have a garden pond about 38 square feet in area and 1½ to 2 ft. deep. It was made in April but no matter what I do and how often I clear it out, I cannot keep goldfish alive for two days. I have emptied and refilled it several times but nothing will live in it. I have tried water snails and *Daphnia* but everything dies in a short space of time. Can you give any explanation?

From the description of what you have done and the dire results, I can surmise that the water is badly poisoned and from several experiences over the past I feel certain that the trouble is copper poisoning. If you have copper pipes through which the tap water comes then this is the cause of the trouble and no matter how often you refill the pond, the result will be the same. If copper pipes are not to blame, then there may be something copper or brass in the pond. It may be thought that I am obsessed with dangerous copper in ponds but over the years I have had several instances where this has been proved to be the cause of quick deaths of fishes in polluted ponds.

A dealer once reported that when taking over a fish establishment all the tanks were served with running water which came through hose piping. Thinking this to be untidy, copper piping was installed instead

of hose. Within a couple of days all the fish were dead. I advised a return to hose piping and all was well. I knew a doctor who had a very nice pond in the patio behind his surgery but he could not keep goldfish alive in it for more than a day or so. I visited the pond and found a long thin copper pipe running from an adjoining house which supplied the pond with a constant stream of water. On the removal of the pipe and fresh tap water, all was well.

Many years ago I made a similar mistake. I was topping up a tank in the living room, containing fantail goldfish. As the tap water was very icy cold, I added a very little from my hot water pipe. Within a day the fish looked sick and all the fine leaves had fallen from the Hornwort. I immediately emptied the tank and refilled with fresh water. My hot water had come from a fairly new copper tank, but I would never have realised that such a very small amount of such contaminated water could have affected the whole of the tank water. It has been said that a fifth part of copper to a million parts of water can be fatal to some fishes, and I am not going to disagree with that.

I made a concrete pond 14 years ago and I now find that it has developed leaks. I want to repair it in the autumn and would like to know the best method to adopt?

The surest and easiest method to adopt is to use a modern liner such as Butyl or Plastolene. Once fitted there should be no more trouble from leaks. If you do not wish to go to the expense of a liner then there are one or two other methods to adopt. If a specific leak can be traced, it is possible to repair this by scraping away any loose concrete and then forcing a fresh mixture into the crack. Use a mixture of one part fresh cement to three parts sharp, washed sand or fine grit. Do not make too wet and keep the mixture to the crack and not on the surrounding surface. If many cracks are found all over the surface, then the whole can be floated over with at least half an inch of fresh concrete mixed as above. You will need to see that the old concrete is quite dry and should be painted with a special material sold for the purpose by dealers in building materials. This is to allow a good join of the fresh concrete with the old. New concrete will not "wed" with old unless treated. It is also possible to paint the whole surface with a rubberised paint sold for the purpose. If such a treatment is used it is important to comply with the makers' instructions.

Please could you advise me about keeping coldwater catfish. They have some at my local pet shop. I have been told that they are bottom feeders and can be fin nippers. Is this so?

Coldwater catfish can not only be fin nippers, they can swallow any fish about half their own size. They are not only bottom feeders but feed mainly at night time. I do not advise that they are kept with any smaller fishes.

Alexandra Palace Attractions



The build-up to London's biggest aquatic Show of 1979 is already under way and the competitive class that probably needs the most enthusiasm and effort, and yet which provides the most colourful results, is of course the Aquarist Societies' Tableaux competition.

We are starting off this series of 'what to look out for at the show' with this competition because, to have any hope of winning the top prizes, the work should soon get progressing or at least the original plan of display should have been decided by now.

This year, the competing societies have a complete free hand with perhaps only one or two restrictions; the rest is up to their ingenuity and talent. So let's set the terms of reference first: Competing societies will have a floor area 8 feet by 6 feet at their disposal. (To avoid the embarrassment of asking Alexandra Palace to remove its doors on the day, a height limit of 8 feet has been set). Within these physical limits, societies may 'do their own thing' to provide Tableaux for the enjoyment of the visiting public. There are no rules that competing fish classes must be incorporated in the design, we don't even ask for the formally obligatory 'furnished aquaria' although societies wishing to show off their prowess in this way are perfectly free to do so.

Naturally, we will not be surprised if the Tableaux reflect the fishkeeping hobby (*we would be surprised if they didn't!*), but this is the opportunity for the societies really to publicise *themselves* and have some entertainment and enjoyment in the process. It is not expected that these Tableaux will be manned (or womanned?) by Society members, but there is no ban on information or Society's advertisements being a feature of the display. One thing that will be enforced however is the Regulations in respect of Fire risk, and the use of flammable material will not be permitted. Copies of the current fire Regulations can be obtained from Alexandra Palace direct.

So much for what the visitor to the show can hope for; what rewards await the lucky entrants? Well, first of all, every FBAS affiliated society entering a Tableaux will receive a financial donation from the show organisers towards expenses incurred in staging a display. The Overall Best Tableaux will win for its society £50, with £40, £30 and £20 going to the next three places. In addition to these awards there will be consolation awards for the Tableaux with the Best Aquatic Content, Best Model, Most Informative and Most Entertaining designs. You may be asking how the Tableaux will be judged. It has been decided to move away from the normal FBAS show practice of allowing only competing societies to judge, and this year a panel of judges selected from amongst the Trade Stand Representatives will be asked to make all the difficult decisions.

In addition to the Society Tableaux, there will be room for Display Stands from the Specialist Societies and applications for space are invited; however, we must point out that for Specialist Organisations not affiliated to the FBAS, a fee of £20 will be charged. We have also been asked to point out that only the Specialist Society's own publications and other merchandise, such as badges, T-shirts, stickers etc., may be sold from its stand; the selling, or disposal by daily competitions or Raffles, of livestock, plants and aquatic equipment will not be permitted. This latter point is only fair to the bona fide Traders who have their stands at the Exhibition too.

We hope all societies interested will be quick to reserve space, there is plenty of it this year, but the sooner we know who is coming we can make sure that the floor space is set out so that everyone is happy, and comfortable. Society Tableaux sites will be of the 'Island' type, visible from all sides, but we appreciate that Specialist Societies may require back-to-back locations for security purposes and this possibility is being considered.

If you want to enter, but have a few worries, why not drop the show organisers a line or contact the show Secretary, Laurie Brazier (66 Ormsby Way, Kenton, Middlesex).

Show schedules are available from the same address, or from the FBAS show stand at Society's Open shows. There'll also be a schedule in a future issue of 'The Aquarist & Pondkeeper' along with further attractions at London's brightest aquatic show. Don't forget the date—13th-15th July 1979!!

Dick Mills, Chairman FBAS Show Committee.

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KOI QUERIES

About two months ago I introduced three Koi into my pond, two of them are always on view but the third seems to be missing. If it is dead would it not have floated or is it living on the bottom where there is plenty of food? Your comments would be appreciated.

An apparently simple question can give rise to numerous answers, none of which may be correct, although if the Koi has died there is no assurance that it would float to the surface.

You do not comment on conditions in the pond or water and presumably you cannot see down to the bottom. I am puzzled why you say there is sufficient food in the depths as either or both statements tend to indicate unhealthy conditions. However, it is possible for a Koi to remain unseen in a murky pond for quite some time and generally they only become tame and used to people in clear water. Also, Koi have exactly the same habits as wild carp and will naturally dig and sift through any mulm on the pond floor in their search for food. You could try changing some water and if the Koi is not seen then, you will perhaps have to accept its disappearance as fact and other reasons may be predators in the form of cats, herons or even kingfishers.

I have a coldwater tank containing two small Koi and a tench, they will only feed on live food which is very hard to find during the winter months. I am now keen to have tropicals, but as a schoolboy, I am not allowed to have another tank so have decided to put the Koi and tench in the pond so that I can have a tropical community tank. Can you please tell me the earliest date on which I could transfer the fish?

I hope you will be patient for some time yet as, even when the present (February) weather improves, it will take several weeks for ponds to reach the sort of temperature necessary for the transfer from indoors to outdoors. From past experience it will probably be mid or late May before we get a settled, mild spell suitable for your fish. In the meantime you can observe your fish and their habits and read everything you can about both coldwater and tropical fishkeeping. It is never a good idea to rush into keeping any form of life without finding out first what are the basic needs. By withholding food for a day or so your fish will probably be prepared to eat other foods and certainly Koi like vegetable. Your tank is not overstocked so your fish should grow before, on the evening of a mild day, when there is no more than five or six degrees (Fahrenheit) difference in water temperatures, your fish can be safely transferred. If all goes well they will explore the pond and no food

by Hilda Allen

need be offered for a few days. However tame they were in a tank they will be less tame in a pond, but by feeding them in the same spot each day they will soon gather there for food at your approach.

It is not necessary to have tench in a Koi pond as Koi are perfect scavengers, but they do live happily together and tench learn to feed "at the top" with the Koi during the summer months.

Over the past two years I have lost a total of 17 Koi, all the fish were imported and I feel I would like to try some British-bred ones to see if I have any better luck with those. Can you recommend a reliable British breeder?

You gave no indication of the size of the Koi or state of your pond so I am unable to offer any suggestions as to why so many fish died. I don't think luck has a great deal to do with fishkeeping! Too many people believe that keeping fish is easy, others think that unless a pond is teeming with fish it is not a success. Both ideas are far from the truth, especially where Koi are concerned. If you are satisfied that your pond is suitable for Koi and that their needs of healthy water and growing space can be met, then by all means try again. There are many reasons why Koi die in our ponds, some are inexplicable; others may be stress, disease, lack of oxygen (in foul water) or just plain ignorance. Overfeeding, leading to intestinal troubles, is common; but I have yet to hear of a Koi dying of starvation. I have sent you the name and address of a reputable British breeder who specialises in Koi. (I would be pleased to hear from any other commercial or amateur Koi-breeders in this country who has stock for sale this season.)

Can you please list some of the best varieties of Koi that are obtainable in this country giving their colours etc.

Kohaku has red patterns on a white body and is the most popular variety in Japan. *Taisho-Sanke* (pronounced Tie-show San Kelt) is a tri-colour with red and black patterns on a white body. *Showa-Sanke* is also a tri-colour, but having red and white on a black body. (Both types of Sanke are very popular in this country) *Utsuri* have large patches of black and another non-metallic colour. For example, *Shiro Utsuri* is a black and white Koi; *Ki-Utsuri* is a black and yellow Koi. *Shusui* (Shu-soo-ee) are two-coloured with a blue back and a red belly, they may be scaleless or with rows of large mirror scales in the dorsal area or along the lateral line. *Ohgoms* are single coloured, metallic Koi (in gold, platinum, orange etc). *Kinrin* and *Ginrin* are all Koi that have gold (Kin) or silver (Gin) iridophores

that sparkle and glint on the scales. There are one or two good picture books of Koi, with superb photographs of many varieties, but it must be said that much of the text does not apply to our own conditions, climate etc. Keeping Koi here is a challenge (or, "you don't have to be mad, but it helps"). Because Koi are such magnificent fish we persist and our efforts are acknowledged in other countries where keeping Koi is much easier than it is here.

I intend to build a pond of about twelve feet by ten with a four feet deep area. Could you suggest a suitable pump to power the filter, its approximate cost and wattage. At present I have 4 Koi, 6 goldfish and 5 orfe. Is there any objection to the others being kept with the Koi?

Your pond will have a surface area of about 120 sq. feet and your filter should be between 30 and 40 sq. feet. I have sent details of two pumps to you, the smaller one should pump approx. 300 gals. per hour and use 75 watts. The larger one is a more efficient pump giving 400 gals. per hour and using 180 watts, this costs around £50 plus VAT. There is no objection to other fish being kept with Koi although to my mind orfe are too quick and lively to be a good match for the more placid and peaceful Koi. It is usually the orfe that dash about and grab all the lovely worms while the Koi get none and for this reason alone I prefer orfe (and rudd) in a pond to themselves.

I have moved into a house that has a round concrete pond about 16 feet diameter and 3 feet deep in the garden which I hope to make into a Koi-pond. I would appreciate any information as to its capacity, suitable filtration etc.

If you make sure that the pond does not leak then, from the measurements given, the surface area will be about 200 sq. feet requiring a minimum filter size of 60 sq. feet and the pond should hold approximately 3,750 gallons of water.

You will need a pump ideally rated at about 1,000 gals. per hour so that, allowing for friction losses through gravel and pipework, this should provide at least 700 gals. per hour. This flow-rate will ensure a good turnover of the pond water every 5½ hours and will match the size of your filter. The plastic pipe used for the under-gravel filter pipes should not be less than 1½ inch diameter, which should be covered by eight to nine inches of well-washed gravel. The whole system should be operated (and dirty water run to waste) for at least two weeks before the introduction of any Koi. Continuous operation is essential for satisfactory biological filtration and time must be allowed for the bacteria to become established within the filter, usually 3-4 weeks in early summer. This may be a suitable opportunity

to remind readers that external pumps sited above water level should be fitted with some form of automatic cut-out device. Otherwise, if the pump stops as a result of mains supply failure, it may later restart without being primed and this can cause serious damage to the seal. This problem does not arise when pumps are situated below the pond water-level as they remain constantly primed and no problem.

I often find your replies very technical and hard to understand, do you think this is a good idea? After all, Koi are only fish and people like reading about fish.

Ah well. I am sure that many readers may find my opinions not at all technical and in any case I can only answer what questions are asked. I am a Koi fan and only try to pass on what I have learned from experience. I have had many letters that say "I have an 8 ft. by 4 ft. pond and intend to breed Koi..." or similar. I think it best that they should understand about fish first and then Koi and then appreciate the problems of growing them to sexual maturity etc. It all depends on one's ambitions. (I am now waiting to hear from someone who has bred Koi in an 8 ft. x 4 ft. pond.) I do try to keep things as simple as possible because I believe that if a hobby is too difficult or expensive then fewer people will be involved. At the other end of the scale I think you would be amazed to what lengths some people do go to keep Koi, but financially this is far beyond the scope of most amateur fish-keepers.

Although I have a large natural pond which is well planted and easy to maintain, I was quite dismayed recently to find most of my fish (including Koi) dead after the thaw. Did they die from the cold?

Perhaps your idea of a large, natural pond and mine might differ? As I do not know the size or depth of your pond or the number of fish involved it is impossible for me to say with any certainty why your fish died. The weather was extremely severe for at least six weeks and ponds were iced over for most of the time. Did you keep open a hole in the ice? If you did not, then your fish probably died through lack of oxygen in foul water. It is essential to keep a good patch of water open, to allow toxic gases to escape. If a pond is 'sealed' by ice, then a dangerous situation develops often leading to the death of fish. If your pond is very shallow then the cold could have been a contributory factor but less likely. Do you run a pump? For the past ten years I have found that a circulation of water is the easiest way to avoid trouble, both in summer and winter. I am very sorry to hear of your losses of course, but I have lost count of the number of Koi that have died in so-called 'natural' ponds and I wish you more success next time.

The common sense of fish names

by James Barrie

VOLTAIRE once said, "All broad statements are false, including this one". And those who shun scientific names because they happen to be difficult, or those who dismiss common names because they tend to be ambiguous, alike fall into the generalisation trap. The reality is that both forms are deeply rooted in the language of fish lore; neither is going to become extinct because we elect to ignore it, and each is functional when applied intelligently.

Scientific names seem to be inescapable. They pervade aquarium literature, infiltrate dealers' advertisements, adorn display-tank labels, and wherever enthusiasts gather together they invariably manage to insinuate themselves into the conversation. All of which the less technically minded members of the fraternity find a little disconcerting. Yet it should be understood that writers seldom resort to scientific names merely to create effect; rather it is because there is always a chance that someone, somewhere, sometime might fail to discern which species was intended in the first place if they did not. An article on, say, "Observations on the Red Devil" would be devalued as a contribution to the study of this fish if the author neglected to mention which of three *Gichlasoma* species so christened was being described. Clearly there is considerable benefit from acquiring a working knowledge of these names.

Pedantic

On the other hand, it would be pedantic to insist that scientific names should be trotted-out on every occasion, even when a widely accepted common name exists and the identity of the fish concerned is not in question. A speaker who loaded his remarks with repeated references to *Carassius auratus* or *Poecilia reticulata* could justly be charged with affectation, since the familiar, equally explicit goldfish or guppy would do instead. In fact, in these circumstances it is

arguable that the respective scientific names, except when applied generally or to "common" stock, are not really adequate: an appropriate common name is needed to convey exactly which domestic strain of goldfish (oranda, comet, Bristol shubunkin) or guppy (veiltail, snakeskin, half-black) is under consideration.

Common Names

Common names* often go back a long way, antedating their scientific counterparts by hundreds of years. Carl von Linné, who fathered the modern system of scientific nomenclature in the eighteenth century, freely adopted such firmly established names, whether of classical pedigree or medieval lineage. During the period when the Linnean system was under development the principal medium of international communication between scholars was Latin, which made it a natural choice as the official language of the new nomenclature, so that extant species' names with strong Greek and Latin connections merged easily into the system, thereby providing a modicum of continuity with the past. An early reference to the tench (derived through the old French *Tenche*—probably meaning "the nibbler"—from the Latin *Tinca*) is to be found in the writings of Cicero (106-43 B.C.), where the Latin version of the name is used derisively to mock some amusing peculiarity of a contemporary orator. Linnaeus incorporated the species into the 1758 edition of his *SYSTEMA NATURAE* as *Cyprinus tinca* (now *Tinca tinca*).

Local Names

Interaction between the scientific and the vernacular has gone on ever since. Local names serve science well, as many aquarium fishes attest: hence the scientific name of the lovely dwarf gourami, *Colisa lalia*, is adapted from the native name *Lal kholisha*. Other local

aquarian

advisory service bulletin No. 13 Aquarium Calculations

I assume you have a pocket calculator so mathematical calculations are no longer beyond your ken. The following information is based on the calculator method:

Capacity

Measure the (internal) length, height and breadth in inches:

Length \times height \times width \div 1728 = cubic feet.

Cubic feet \times 6.23 = Imperial gallons.

Imperial gallons \times 4.55 = Litres.

Litres \times 1000 = cc (cubic centimetres, also called ml, millilitres).

Dosing

For calculating dose levels of medicine subtract about 10% to allow for gravel, rocks and equipment if present:

Capacity (gallons or litres) \times 0.1 = value to be subtracted.

Weight

Imperial gallon \times 10 = weight of water in lbs.

U.S. gallons \times 8.34 = weight of water in lbs.

Litres \times 2.2 = weight of water in lbs.

Litres \times 1000 = weight of water in grams.

For total aquarium weight add on gravel (100 lb/cubic foot) glass (5 lb/square foot) and rocks (150 lb/cubic foot).

Stocking Levels

Measure length and width of surface in inches:

Length \times width \div 20 = No. of small fish (1 in. to 2 in.).

Length \times width \div 40 = No. of medium fish (3 in.).

Length \times width \div 100 = No. of large fish (max. 6 in.).

Levels can be higher with frequent partial water changes, lower if the fish need to grow.

Temperature

Celsius (centigrade) value \times 1.8 = + 32 = value in Fahrenheit.

Fahrenheit value $-$ 32 = \times 0.556 = value in Celsius.

Hardness Conversion

DH (1 part CaO in 100,000 parts water). English (or Clark) degree (1 grain CaCO₃ per Imperial gallon).

American degree (1 grain CaCO₃ per 1,000,000 parts water).

*DH \times 17.9 = ppm. *DH \times 1.25 = *English.

*English \times 14.3 = ppm. *English \times 0.8 = *DH.

ppm \times 0.07 = *English. ppm \times 0.056 = *DH.

Soft water is up to 50 ppm, moderate around 100 ppm, hard over 200 ppm.

General Conversions

1 inch \times 2.54 = cm.

centimetres (cm) \times 0.3937 = inches.

1 ounce \times 28.35 = g.

grams (g) \times 0.03527 = oz.

l/gl (gram per litre) \times 0.17 = ounces per Imperial gallon.

1 ounce per Imperial gallon \times 6.66 = grams per litre (g/l).

David Ford.

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names have achieved a widespread currency in their own right; that of the much maligned *piranha* comes from a South American Indian language called Tupi-Guarani and means "toothed-fish". But the majority of these names are essentially colloquial and therefore of restricted circulation: so *Balantiocheilus melanopterus* is called *pla hang mai* (the burnt-tailed fish) in its native south-east Asia, whereas in the West it is better known as the silver, tricolour or Bala shark.

If common names can become scientific names, then the opposite is also true. Several popular names are related to defunct or current scientific names. Tetra comes from *Tetragodon*, a genus which included a number of aquarium characins in the early days of the hobby; *Acara* refers to a deposed genus of South American cichlids and survives only as a popular name; molly and platy stem from the former *Mollienesia* and *Platypoecilus* genera, while guppy, commemorating the discoverer, is retained from the old species name *Girardinus guppyi*. A few names have simultaneous scientific, local and popular connotations: *Badis badis*, after a native name, is simply the badis to fishkeepers.

Descriptive Names

Local and popular names are definite enough in a generic sort of way, but they are mostly too general to denote particular species. Zoologists, naturalists and aquarists favour a type of name that is more precise. For this the term *descriptive name* (elsewhere the "book name") is appropriate, because it is devised to identify species, sub species and varieties, typically by highlighting distinctive characteristics. Thus banstickle, jack-sharp, sharplin and tittlebat are local names of the popularly acclaimed stickleback. Now all sticklebacks do not belong to the same species, although it is impossible to tell from any of these isolated names which is intended. By prefixing a series of epithets to the popular name the position can be clarified: the three-spined stickleback (*Gasterosteus aculeatus*), the ten-spined stickleback (*Pungitius pungitius*), and the American brook stickleback (*Culaea inconstans*). Further examples of suitably modified popular names are the head-and-tail light tetra, the blue acara and the tiger barb. Descriptives can also be loosely translated scientific names, as with the half-banded barb (*Barbus semifasciatus*), the spotted sleeper goby (*Dormitator maculatus*) and the Montezuma swordtail *Xiphophorus montezumae*. If the scientific name changes, of course, the original link is broken and we are left wondering about it but, as has been shown with names like molly, platy and guppy, no harm is done. Other descriptive allusions are to size (the giant danio), shape (the humpbacked limia), deportment (the headstander), disposition (the Jack Dempsey), behaviour (the scale eater), habitat (the swamp killi), distribution (the Peruvian longfin), and so on.

Descriptive variety names are unique in that they

are obligatory common names. This is because varieties have no standing in zoological classification and nomenclature. In botany the form *Primula denticulata* var. *alba* is admissible. Not so with animals. An expression such as *Betta splendens* var. *rubra* is incorrect. In spite of this, many of the variety names used by aquarists are as definitive as scientific names. In particular, those varieties selectively bred to conform to agreed standards have been carefully described, so that the specialist breeder knows in detail the requisite features for each named strain being developed, be it bramblehead goldfish, pintail guppy, hi-fin swordtail or taisho sanke koi. As a goodly proportion of the fishes maintained by hobbyist come into this category, it can scarcely be disputed that common names of this type, at least, are of value.

Good Common Names

Aquarium literature is littered with examples of confusion caused by someone frivolously attaching a wrong or pseudo-scientific name to a species, especially when it is a new importation. Collectors, traders and amateur aquarists alike have been guilty of this dubious practice in the past, so no section of the hobby can afford to throw stones. However, it must be more prudent when in doubt to settle for a relatively harmless common name than to rush prematurely into print with a spurious scientific name. Some specialist groups experienced in dealing with rare and new fishes have discarded names altogether in these cases. Instead they allocate a unique code number to each unidentified species pending reliable expert assessment. While this eminently sensible and responsible approach is to be applauded, it is unlikely to attract support from the average fishkeeper or dealer, because the modus is neither appealing nor memorable. Traders who have to make a living by selling fishes are still bound to fall back on the expedient of, hopefully, *good common names*.

Rules

Rules governing the composition and utilisation of scientific names are regularly explained in aquarium publications. Less that is constructive has been written about common names. What is a good common name? Back in the 1950s a joint committee of distinguished ichthyologists from the American Fisheries Society and the American Society of Ichthyologists and Herpetologists studied this question and eventually gave their answer in a book entitled, *A LIST OF COMMON AND SCIENTIFIC NAMES OF FISHES FROM THE UNITED STATES AND CANADA*. In addition to cataloguing the names of fishes, they set down nineteen principles pertinent to the selection of common names, for the guidance of scientists and fisheries' workers. As they are not without relevance for the fishkeeping hobby, the following is a shortened adaptation of the principles.

1. Each species should have a single recognised common name.
2. No two species should share the same common name.
3. Names should be simple.
4. Common names should not be capitalised except for those elements that are proper names.
5. Names should not violate the tenets of good taste.
6. Colourful, romantic, fanciful, metaphorical and otherwise distinctive and original names are especially appropriate.
7. Native names are suitable for adoption as common names.
8. Regardless of origin, truly vernacular names that are widespread and in common use by the public should be retained wherever possible.
9. Commonly employed names adopted from traditional English usage may be given considerable latitude in taxonomic placement (e.g. shark, as in redtailed black shark).
10. Structural attributes, including colour and colour patterns are desirable and should be used in framing names.
11. Ecological characteristics are useful in making good names.
12. Geographical distribution provides suitable adjectival modifiers.
13. Generic names may be employed outright or in modified form.
14. The duplication of common names for fishes and other organisms should be avoided if possible, but names in wide general use need not be rejected on this basis alone (e.g. butterfly fish is acceptable).
15. Names that appear on lists of names of fishes prepared by official bodies should be preferred.

In making this abridgement, points are omitted with a patently American bias (e.g. "American Indian names are welcome, etc." is replaced here by the broader "Native names . . .") or that are open to objection (e.g. "Only clearly defined and well-marked taxonomic entities (usually species) shall be assigned common names", which places a limitation on their application to sub species and varieties, both important to the hobby). The principles enshrine a wealth of simple wisdom and were never more apposite than at present. If they were universally adhered to most of the legitimate criticisms directed against common names would lose their edge.

FBAS Booklet

Misunderstandings result from contravention of the first two principles, namely, failure to ensure that each species has only a single recognised common name and no two species share the same name. Instances are not hard to find. That helpful little booklet which emanated from the Federation of British Aquatic Societies in 1976 called, A DICTIONARY OF PROPER AND COMMON NAMES OF FRESH-

WATER FISHES, chalks-up five common names for the characin *Gymnocorymbus ternetzi* (i.e. black widow, black tetra, blackmoor, petticoat fish and butterfly tetra) and labels five different species as the red-fin barb, with a sixth barely separated as the red-finned barb. Just to make life more awkward, *G. ternetzi* apparently has a fin in both puddles, sharing one of its names, the black tetra, with *G. thayeri*. These may be extreme examples, but an analysis of nearly 2,000 species from the FBAS booklet revealed that roughly one fish in seven suffered from common name anomalies. Groups of fishes popular with hobbyists fared rather worse. This was confirmed as a pattern when a small sample of eighty fishes (taken from C. Harrison's TROPICAL FISH, 1976, because it was written for the tyro and had a representative cross-section of normally available species) was examined for comparison: two in five were shown to have common name irregularities.

Stabilisation

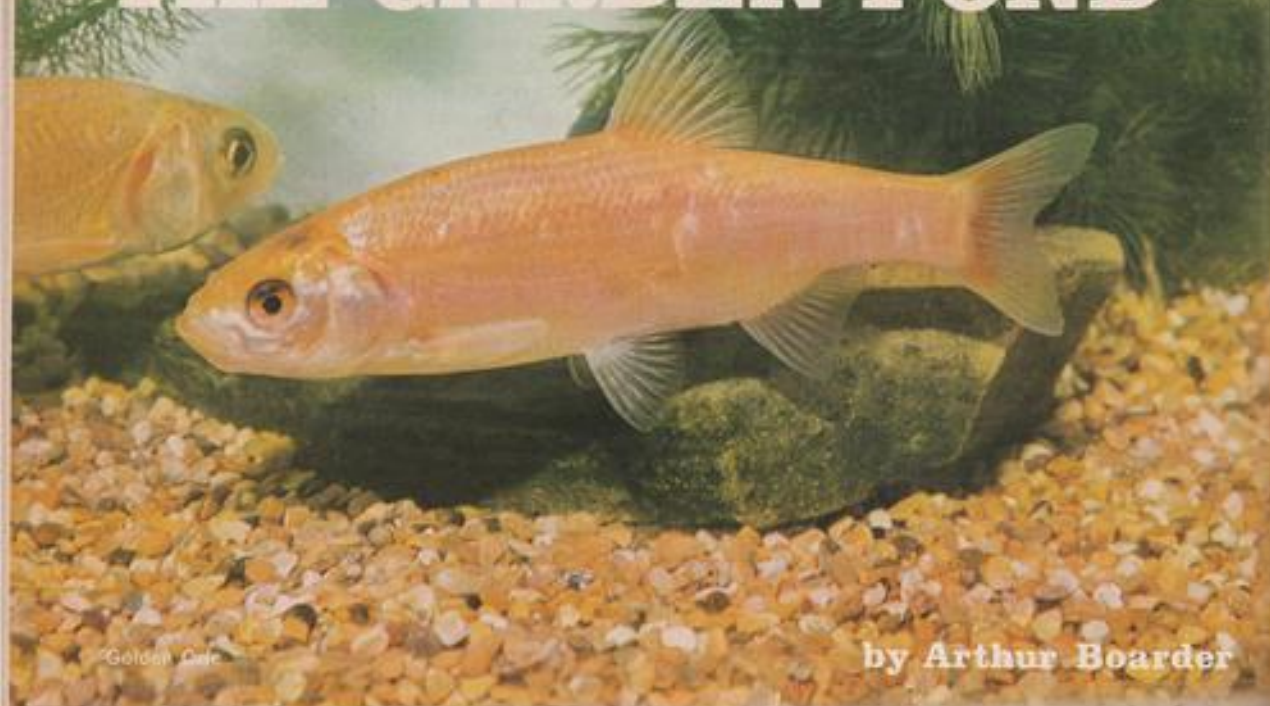
A prime objective of the two bodies who sponsored the American LIST was to stabilise the application of common names within their sphere of influence. Is it beyond the bounds of possibility that some day the organised fishkeeping hobby might feel it worthwhile to promote a similar campaign? A ready-made launching pad exists in the shape of the FBAS booklet. Future revisions could give textual prominence to recommended common names, and their exclusive use could be encouraged throughout the Federation and in the ranks of those exhibiting fishes under FBAS rules. It would be a small but significant lead. Long term, for such a scheme to be truly effective, a great deal of research, broadbased consultation and international co-operation would be necessary.

The proposition is not that common names should be allowed to supplant scientific names amongst hobbyists, or that all fishes perforce should be given common names. There is no viable substitute for the correct scientific name. But as long as people are people and hobbyists are hobbyists there will be common names; the only thing open to choice is whether they will be bad names or good names. Commonsense suggests that it would be in everyone's interest if they were uniformly good names; is it reasonable to expect that this will happen by chance?

*Common name is used throughout in a general sense for any non-scientific name. Local names are those of native origin. Popular names are those that have a widespread acceptance, irrespective of their origin. Descriptive names are those specially devised to identify specific organisms.

In making these arbitrary distinctions it is acknowledged that in practice there is considerable latitude; overlapping between categories is inevitable and the terms common and popular are frequently interchanged, taking a meaning akin to that reserved here for descriptive names.

THE GARDEN POND



Golden Carp

by Arthur Boarder

Stocking with fish

IN PREVIOUS articles I have dealt with the making of a garden pond and adding the plants. I will now deal with the stocking with fishes. The time for adding these will depend on the state of the water and the time of the year. The water should be fairly clear but a little green colour will not matter very much. I do not advise that fishes are put in the pond during the winter unless they are transferred from one outdoor pond to the new one without the chance of them warming up at all. Obviously the spring and summer are the better times as the fishes can get well established before the winter.

The number of fishes to be introduced is very important and over-stocking must be avoided at all costs. There is nothing clever in having large shoals in a small pond. The general rule of stocking for a tank is not good enough for a pond and I recommend that only an inch of body length of fish should be placed in the pond for each square foot

of surface area. This will give them a good chance of thriving and growing. Therefore a pond ten feet by six feet should only hold sixty inches of fish. Thirty two inch body length of fish will then be the rule for this pond.

The types of fishes will be an individual choice but for the beginner I suggest that only common goldfish are used for a start. Also, only put a few fishes in at first and if they appear to be doing all right then more can be added. Goldfish are usually the cheapest to buy and so a loss or two will not be too hard to bear. It would not be wise to stock with expensive fancy goldfish before the state of the water had been discovered. Comet goldfish are also quite a good choice as they are a faster swimming fish having a streamlined body with a long tail. Another handsome fish is the shubunkin. These will add a fine touch of colour as they can be in either the London or the Bristol type. The former are better for the pond as they do not have such flowing finnage as the latter type. Any fancy goldfish with large flowing fins are sometimes liable to become affected with fin congestion or fin-rot. The shubunkins should have a ground colour of blue with red, brown, yellow and

mauve. These colours should be well defined and spread over the body. Also black spots should be sprinkled over the fish.

Additions

Once the first fishes have been in the pond for a month and look healthy and thriving it is time to add others as long as the total stock rate will not be exceeded. The fantail goldfish is one of the best fancy goldfish for the pond as it is more handsome and unusual than the common goldfish. These fish have short bodies and a double tail which should be well held out behind and not droop. These can be obtained in red scaled or calico types. I have found these fish quite hardy and so can be left in the pond all winter.

The fantail moor is another fish which will add to the variety of colour in the pond. The lionhead goldfish can also be added as it has finnage similar to the fantail and can stand cold conditions. There are several other varieties of fancy goldfish which some pondkeepers might like to have but they may not be as hardy as those mentioned above. Such kinds are:—Veiltail, oranda, pom-pom, veiltail moor, celestial, bubble-eye, pearl-scale and any of the newer varieties not yet kept in this country long enough to

be able to assess their hardiness. The pearl scale could be kept in the pond but its distinctive scaling would not show up much.

My next choice of fish for the pond is the golden orfe. This is one of the finest pond fish, but only for a pond of a fair or large size. Any pond under 10 feet \times 6 feet is unsuitable for orfe, except when they are small and probably not more than three years old. These attractive fish are streamlined and fast swimmers. They are surface feeders and swim in shoals at or near the surface of the water. They can grow to over eighteen inches in length and so their use in a small pond would not be an advantage. The orfe can stand any amount of cold but in hot weather they must be watched in case the water loses too much oxygen, when the fish are soon in trouble. If orfe are used I suggest that a small shoal, say half a dozen, are introduced when they are small, not more than a year old. They grow very quickly if well fed and are usually in view in the pond.

Many pondkeepers favour the introduction of coldwater catfish, but I do not think that it is a good idea at all. These fish are voracious carnivores and will attack and swallow any fish small enough to get into their huge mouths. In any case they are bottom

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Koi



Commentary *by Roy Pinks*

IN THIS NEW column I will think aloud from month to month on a range of topics which I hope will be helpful to most readers as well as stimulating. It is a sobering thought that most people buy magazines and read articles because they are having problems and want to solve them by reading of others' troubles and of new techniques. Hence they are unlikely to be cheered or impressed by the barrage of success stories directed at them by many writers who, so it seems, have never put a foot wrong. My aim will therefore be to record things as I have experienced them and to comment on the reactions of the trade to our varied demands. The stuff of this unique hobby is debate and exchange of information, and I hope that readers will write to agree or disagree, for such is the way in which we shall learn more about it and about each other. I might add that as I have no commercial interests I am in a position to speak without the inhibitions of many existing contributors, but at the same time it is important that the trade does get its points across, as "them and us" is no sort of way in which to run a hobby.

By the time this appears in print perhaps the scars of the winter weather and the strikes will be behind us and the pondkeeper will be looking forward to another season. The fortunate owners of fish houses will have suffered nothing worse than strained pocket books on account of horrific heating bills, and cold-water enthusiasts will be preparing their stock for breeding by increasing allocations of live food and deciding on suitable matings. But I am very concerned about how our ponds will have fared during the past few months as, in many parts of the country the ice has remained unbroken for weeks on end. At times like these we come face to face with the real facts of how to maintain ponds during bad winters, especially those which are situated in the more exposed areas, and I should be very interested to hear of successful attempts to maintain holes in the ice throughout the freeze. This is, after all, the key to preventing your overwintering fish from being overcome by the toxic gases which build up beneath the ice. Much will depend on how much rotting debris there is, and even in the best regulated pool there is an appreciable quantity resulting from last year's lilies and the submerged oxygenators. The quantity and size of fish will only affect the issue to the extent that the larger ones will tend to die first because depleted oxygen supplies will hit them hardest, but in truth their demands at this time of the year are so small that one often wonders whether their demise is due more to their higher intake of toxic gases than

purely to lack of oxygen. The truth probably lies halfway between the two possibilities.

Despite the reputed popularity and effectiveness of the pool heater I have never invested in one because my ponds are a long way from the house and trailing cables are likely to get lost in the snow, thus causing problems all of their own, but I believe that in many situations they do keep a hole open. But does this hole really serve to keep all the fish alive even if the pool has more than a fair share of debris, perhaps because it has not been cleaned out for several years? A confident answer here would greatly enhance the selling power of these appliances.

Short of one of these it has been difficult to preserve blow holes because they so quickly freeze over. The often repeated advice to drain some water from the pool after making a hole is sound enough if you do not have gale force biting winds freezing the water in the hose whilst the pool is being emptied, and one of the better ideas which I adopted this winter was that of building a cover to the hole with an insulated wooden box and covering this in turn with several layers of sacking. So intense was the cold that even so the water froze, but it was comparatively easy to break it gently with a garden hoe at the next visit, which had to be sooner than one would have wished.

Despite all measures to keep small areas free of ice I have lost a lot of fish, and the distressing thing is that most are still frozen into the ice, so that they, too, are decomposing and adding to a worsening situation. Golden Orfe and Golden Rudd, together with Roach and Rudd have all been affected, and I suspect that the coming season will require me to clean out the whole of my large pool and begin again. The ponds have been neglected somewhat during the past few seasons and it is probably time that they were emptied and replanted. I have tended to take the line that natural ponds are never emptied and the fish still survive, so why do we bother to treat artificial pools with such periodic violence? As a consequence I have usually removed the worst excesses with a fine meshed net, and this has included huge quantities of black mud which contributed a measure of distinction to the compost-heap as well as, apparently, improving the conditions underwater. The temptation to leave things much as they are is strong, because the annual cycle proceeds satisfactorily, there is never any green water, and the fish reproduce tolerably well. I think that much will depend on whether any fish have survived at all. Nature seldom destroys all life even when it really puts the pressure

on, and if some fish have come through this very severe testing it probably indicates that this is the survival norm for this particular pond under particularly unfavourable conditions. That being so, I am more inclined to leave it alone during the coming season, apart from routine maintenance, than to take the whole thing apart. As regards tropicals I have had a rather unsatisfactory winter, too.

Apart from a good first season with Barbs, which I have not kept for many years, I made attempts to improve my tetra collection last autumn, but the results were patchy as well as rather puzzling, and I will elaborate on this subject in a future article. My reserve-cum-quarantine tank was recently taken over by a neighbour's fish, and this has prevented me from making much progress since Christmas. Here I was a victim of my own counselling, as I had so bullied this good lady into giving her recently failed tank a long period in which to regenerate its plant life that I had to offer to look after the survivors in the meantime. I am afraid that there will be some problems ahead, too, as she wishes to start off again with this nucleus of a Red Finned Shark, a fully grown Beacon and a Dwarf Gourami, gradually building up to a tankful of the smaller and brighter jewels like Neons and Glowlights. I have tried, unsuccessfully so far, to persuade her that the three fish I am looking after are not the best companions

for the immature replacements she will undoubtedly buy, but as they are family pets, it is a losing battle. Worse still, I have volunteered to help her choose her new fish, so the responsibility is going to be a heavy one. I hope to report a successful shopping expedition in due course. One point I have a least got across is that she should spend no further money on fish until she has got the plants right, and I have advised her to buy as many of these as she can afford every week until I tell her to stop. It is an extremely important feature of newly set up aquaria, and of aquaria which need revitalizing, that no fish should be added until you can actually see the new plants putting on growth. This is a sure sign that all is well in the vegetable department, and this being so, the fish are much more likely to settle down without undue stress. It is not simply that balance is involved, but most fish do like to have seclusion during their first days in new surroundings. They are always upset and nervy after transportation and the changes of water, and many like to retire to plant thickets to gather their wits. Other species, less fussy about changes, take to pruning or nibbling or attempting to uproot your careful plantings, and if, during the initial period, the roots have managed to penetrate the substratum, the plants are much more likely to hold their own and to reproduce themselves when conditions are more favourable still.

READERS' LETTERS

After Sales Service

I should like to express via this column, my deepest thanks to the firm John Allan Aquariums Limited, and to tell other readers of this magazine and potential buyers of their aquariums, about the excellent after sales service that I recently experienced.

Recently I wrote to them, explaining how one of the frame-retaining straps of my 53½ x 12½ x 15 in. Gem tank had snapped away from the frame, resulting in a slight, but nevertheless worrying, concaving of the front glass due to the water pressure. In my letter I asked if there was any risk of my large (and consequently expensive) angelfish, suddenly losing their home and if there was anything I could do to remedy the situation. A few days later I received from John Allan Aquariums, free of charge, a complete replacement strap and an explanation of what should be done to repair the tank. I think you will agree that this is worthy of praise as one rarely encounters such service these days.

Yours faithfully,
T. Lyon,
"Alderley",
12 Vinery Lane, Plymouth,
Plymouth, Devon PL9 8DE

Come and join us

Dear Sir,

On reading the letter by Roy Haythornthwaite in the February Aquarist I was reminded of the value of the local 'Fish' society. I have been a member of Huddersfield T.F.S. for a number of years now and my experience shows that rarely are the problems of members left unsolved but answered sometimes by other members, sometimes by visiting lecturers. As to the comment on shop-bought live foods: for some years now I have been culturing my own comprehensive list of them and find that I now spend hardly anything in that department. I have been successful enough to spend some of my time lecturing to other societies on the subject and realize that Mr. Haythornthwaite's comments are echoed time and time again, but as the only place to hear/see such lectures/slide shows etc. is the society, I offer this advice to all aquarists: join your local society (there is one in Nelson, Mr. H.) where you will learn to "do it yourself." You will be surprised how little it will cost you.

Yours faithfully,
IAN J. BANGHAM,
41a Underbank Old Road,
Holmfirth,
Nr. Huddersfield.

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feeders and mostly keep out of sight in the pond and so their introduction seems to me to be a waste of money and a source of danger to other fish.

A fine fish for the larger pond is the Koi. This is a fancy carp bred by the Japanese and is a rather elongated fish with a largish head and the body tapers thinly to the tail. These fish may be obtained in various colours, some with a bronze shiny finish. Others may be white with red and/or black markings. They can grow quite large, to over two and a half feet and so are unsuitable for a small pond. They have been imported into this country for many years now but it seems that no ordinary names have been given to them as yet. They are still known by their Japanese names such as:—Kohaku; Hi-Utsuri; Sanke; Bekko; Taisho; Showa; Tancho; Asagi; Shusui; Ogon; Hariwake; Kin Gin Rin; Hikari Mono; Karawi and several others. It can be realised from this list what a vast range of types and colour there are. However, I do not think that they are a beginner's fish as they can be very expensive, some cost as much as £100.00. Also, it is found that besides needing plenty of swimming space, they thrive much better in well oxygenated and filtrated water. Small specimens could be added to a good sized pond but as they can grow very fast if well fed, they are really only suitable for a large pond. There is a British Koi Keepers Society in being with over a thousand members at the time of writing.

Another fine fish for the large pond is the Higo. This is a well coloured carp with a much heavier body than the Koi. It can grow quite large and so is not suitable for the small pond. However, it is not a fussy fish and can thrive in waters which would be unsuitable for Koi. It is a bottom feeder mostly and a slow swimmer, not likely to be seen much except at feeding time when it will come up for pellet food.

There are several British coarse fishes which can be introduced to a pond providing that there is plenty

Golden Tench



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Fantail

of space for them. Some pondkeepers like to have a well mixed collection of fishes and the following will prove suitable. The first choice can be the Carp. These fishes are hardy and long lived, also not very fussy as to water condition. The common Carp can grow very large, one of over forty pounds has been caught, but this size is not likely to be reached in your pond. It is mostly a bottom feeder and is not likely to be on view except at feeding time. The Mirror Carp is a rather similar fish but it has a few large shiny scales along the sides of the body. The Crucian is another kind and is rather similar in shape to the goldfish. These three Carp need not be added to any small pond as goldfish will prove much more satisfactory.

A handsome fish which is a favourite with many pondkeepers is the Tench, (*Tinca tinca*). This fish is obtainable in the green type and the golden. The latter is more handsome but more expensive to obtain. The Tench is a fish which is not likely to interfere with any other fishes in the pond. It can grow to a good size and so only small specimens should be added to the garden pond. These fish can be bred in a garden pond and the young are quite handsome whilst small.

Disease

The Rudd, (*Scardinius erythrophthalmus*), is a handsome fish with a silvery body and red finnage. However, as it has a dark back it cannot be seen very well from above. It is a hardy fish and does well in a pond with water in good condition. The Roach (*Rutilus rutilus*) is not as suitable as the Rudd as many pondkeepers have found that it is very prone to become attacked by Fungus disease. As it is very similar in appearance to the Rudd I think it is better to leave this fish out. I do not suggest that it cannot be kept in the pond but in this case it should be introduced as small specimens and great care must be taken in handling these fish; they have such a large amount of mucus on their bodies that it is easily

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rubbed off leaving the fish probe to attack. I think that much of the trouble in keeping these fish could be avoided if more care was taken when handling.

The Minnow (*Phoxinus phoxinus*) is a pretty little fish which will do well in water which is in good condition as it likes a clear stream or river in nature. It only grows to about five and a half inches and so is quite suitable for a small pond.

The Bitterling (*Rhodeus sericeus*) is an even smaller fish barely reaching three and a half inches. This fish is better kept in a tank as its interesting breeding habits can be better observed. As is well known this species lays its eggs in a fresh water mussel, where they remain until they hatch. However, I do not recommend that mussels are put in a pond as they could die, remain undetected and so pollute the water. Mussels breeding in a pond could cause harm to the fishes as their larvae live on the bodies of fishes. The mussel used by this fish is the Painter's mussel (*Unio pictorum*).

The Gudgeon (*Gobio gobio*) is also sometimes kept in a garden pond but as it is a bottom feeder it may not be seen very often. The Sticklebacks, either the Three-spined (*Gasterosteus aculeatus*) or the Ten-spined (*Pygosteus pungitius*) can be kept in a very small pond but it is as well to have only one male as fighting could take place during the breeding season.

The following British fish are not suitable for inclusion in the stock for various reasons, either because they are essentially river fish, grow too large or not likely to be seen:—The Bleak (*Alburnus alburnus*), the Chub (*Squalius cephalus*), the Dace (*Leuciscus leuciscus*), the Barbel (*Barbus barbus*), the Bream (*Abramis brama*), the Ruff or Pope (*Acerina cernua*), the Stone Loach (*Noemacheilus barbatulus*) and Spines Loach (*Cobitis taenia*).

Now a few fishes which are carnivorous and so must never be put in the same pond with smaller fishes or even fishes of other species: the Pike (*Esox esox*), the Perch (*Perca fluviatilis*), the Eel (*Anguilla anguilla*), the Trout (*Salmo trutta*), the Rainbow Trout (*Salmo gairdneri irideus*) and the Salmon (*Salmo salar*). The three last named fishes can eat smaller fishes and they are not likely to live for long in a garden pond.

Pests

When buying goldfish varieties watch that you do not get any fish which is flying its flag at half mast. Their flag is the dorsal fin, and if this is well extended all should be well. Before putting fishes into the pond examine them for pests such as fish lice, (*Argulus*) or any signs of disease. Treat them as carefully as possible so that none of their mucus protective covering is disturbed.

Shubunkin



Coldwater jottings

by Frank W. Orme

APRIL may well be a month when many a newcomer to the coldwater fishkeeping hobby will think that they have been taken for an April Fool. For it is at this time of the year that so many people, deciding that they would like to keep a few fish, visit their local pet-store. All too often their purchases, so proudly carried home, are doomed to an early death through disease or mistreatment. Perhaps more experienced aquarists will therefore forgive me if I cover a few basic points for the benefit of the less experienced. After all—a disillusioned fishkeeper is a lost hobbyist!

First impressions should always be heeded. A dirty, untidy shop and unhelpful staff would be sufficient reason to suspect that little care has been devoted to the live-stock. Take a close look at the stock tanks to see whether it is dirty or unduly overcrowded; are the fish active or sulking, are there any dead fish? If all seems well the occupants can be given a close scrutiny. The fishes should be swimming in an easy active manner without any apparent jerkiness, the eyes clear and bright without any trace of a cloudy film. The body must appear well nourished, the scales clean and shining, with the fins all held stiffly erect there must be no sign of injury to any part of a fish. Avoid fish that exhibit any of the following faults: a wasted body that makes the head seem over-large; dull, cloudy eyes; split or torn fins; blood spots or streaks anywhere on the body or fins; a white bloom or film over the head or scales; scales that appear to be standing up instead of lying flat. There should not be any sign of small white "cotton-woolly" tufts of fungus. Nor must there be any minute white spots, pimples, ulcers or other obvious faults. Fish which have what looks like fine pieces of thread attached to any part of its body, make sudden wild dashes and/or scratch themselves against firm surfaces in the tank are infested with parasites. Any fish which has difficulty rising from the bottom of the tank, or keeps floating to the surface like a cork is suffering from a malfunction of its air-bladder. Just

to be on the safe side it is safest to avoid any fish that occupies the same tank as an afflicted fish. Exercise caution at all times, for it is far better to be safe than sorry—better to go away empty handed and try elsewhere.

Having found and purchased an apparently healthy fish of your choice, the same careful caution must continue to be exercised after it has been carried home. On no account should a newly acquired fish be put with known healthy stock—the apparently healthy newcomer may be carrying a latent disease that has yet to manifest itself. A precautionary period of quarantine should always be given to any new stock, the isolation should be for not less than 14 days and, preferably, extend to a period of 28 days. During this time a careful watch must be kept and immediate remedial action taken if any malady should develop.

Whilst undergoing quarantine the fish should be fed with good nourishing foods in order to build up its strength, the likelihood being that the fish will be in a weakened state due to having received little to eat from the various dealers through whose hands it has passed. If at the end of the quarantine no ailments have arisen it will be reasonable to assume that the fish is healthy and safe to join any existing stock.

Pond spring cleaning

April is an ideal month to attend to any ponds that are in need of cleaning and tidying before our all-too-short spring is fully upon us. At this time of the year the plantlife is showing signs of renewed growth and the fish have recovered from their winter rest, thus the disturbance of the cleaning operations should cause little upset. First lower the water level sufficiently to enable the easy netting of the fish, which can then be placed in containers that are out of harm's way and cannot be accidentally knocked over. The remaining water and black bottom ooze can then be disposed of. Take care that no fish are hidden in the sediment.

Although having a detrimental effect in the pond, if allowed to accumulate, it will make an excellent top dressing on the garden where the strong smell will soon disappear in the fresh air. Any plants which are in need of thinning can safely be reduced before scrubbing the sides and base of the pond to remove any overgrowth of algae. The pond should then be swilled and emptied a few times, until the water is clear, and then refilled. When returning the fish be sure that the water temperatures have been equalised, the containers can then be turned on to their side to allow the fish to swim out. Never pour, or throw, a fish into water of a different temperature; both are liable to invite trouble.

This is also the start of the pond planting season and, amongst pond plants, pride of place must surely go to the water lily. There are few ornamental fishponds that do not contain at least one specimen of this popular plant, dedicated by the ancient Greeks to the Nymphs. The genus name *Nymphaea* was bestowed by Linnaeus—the great botanist who died in 1778 at the age of 71 years. The water lily ranges from the diminutive *N. tetragona* up to the gigantic tropical *Victoria amazonica*, which has leaf pads so large that they can support the weight of a man without sinking.

Over the years horticulturists have produced a number of beautiful hybrids which bear most attractive coloured flowers and suited to various water depths and temperatures; many of these are suitable for growing in our climate and will do well in the garden pond if proper care is given to the selection and planting. A glance through a nurseryman's catalogue of water plants will usually reveal a number of different varieties of water lilies each suited to a particular size and depth of pond. Our native water lily, *N. alba*, can be found growing in many lakes; it bears large pure white flowers with bright yellow stamens. Unfortunately this lily is not suitable for the average garden pond as it grows very large and requires very deep water.

I do not intend to suggest or recommend the names of any of the available varieties because this is very much a matter of personal choice (and depth of pocket). However, I would offer a word of caution against purchasing plants that are stated to be for a depth of water that is either much deeper or shallower than can be provided by the pond in which they are to be planted. A shallow water variety will never be happy if planted out of its depth and may well fade away. On the other hand, the more robust water lily of the deep water varieties will settle down reasonably well in shallow water and commence to cover the water surface with a blanket of crowded overlapping leaves that exclude the light from both fishes and submerged plants alike—it then becomes a nuisance rather than a subject of admiration. True, the lily pads can be cut back, but this will only be a short term solution and the problem will quickly return. Keep the choice of water lily within the range of varieties suitable for their eventual home and all should be well.

April, 1979

Water lilies can be planted in a good stiff loam—preferably in one of the special plastic containers that can usually be purchased from the same source as the lily; it is not necessary to add any fertiliser as the roots will seek nourishment in the bottom silt, as the plant grows. Make sure that the plant's rhizome is secure and not likely to float to the water surface, but do not cover the growing crown; the container can then be gently lowered into the water, taking care that the planting medium is not disturbed. The lily should not be placed immediately at the full depth; ideally the container should be supported in some way just below the water surface and, as the plant grows, slowly lowered, until after a time it has reached the full depth with the leaves floating at the surface.

As with any other plant, it pays to remove the spent heads of faded water lily flowers, which will encourage further blooms to form and, of course, prevent the dead flowers rotting in the pond. During the autumn the leaves and stems can be gently pulled off the plant, as they die back, so that as little pollution as possible is caused by decaying lily growth as the plant becomes dormant for the winter.

Established plants that have become overcrowded can be lifted and the rhizomes washed clean. Inspect the plant carefully to find the young new growing crowns and then, with a very sharp knife, cut through the old stock to remove one of the crowns together with a few attached roots. This young plant can then be treated exactly as already described.

Give the water lily the care and attention that it deserves in the early days and, when established, it will grace the pond for many years with very little further attention, providing shade for the fishes and pleasure to the onlooker for many years to come.

Fish-farming

The headline, in the Birmingham Evening Mail of 30th of January, read "Breeding success on the fish farm" and was followed by a story about the work of a Fish Culture Unit at Aston University.

Aston University is not so very far from Birmingham's Inner Ring Road, which carries a great deal of heavy traffic. There, in a converted garage at the rear of the University, is one of the biggest fish-farming research units in Europe where they have a thriving colony of rainbow trout.

A team of 30 scientific workers is carrying out vital work into many aspects of one of the fastest-growing branches of animal husbandry—aquaculture.

Led by Professor Allen Matty and Dr. Niall Bromage of the university's Biological Sciences Department, the unit is conducting experiments into the nutrition and physiology of fish used in the expanding fish farming industry. Fish farming is no longer the small business that it once was.

The latest Ministry of Agriculture figures show that the production of farmed fish is now between £2½

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The Mollies (1)

by Barry Durham

Mollies are livebearers—so most people think they are easy to keep and breed. But this is not strictly true as most of them need special conditions if they are to prosper and breed to their full potential. For instance, as the majority of the ten species come from coastal waters they require quite a bit of salt in their aquarium and this is not always to the liking of the other inhabitants if they are housed in a community tank. They also prefer vegetable matter in their diet and really the only way to keep them successfully is to maintain them in their own aquarium.

That apart, however, most aquarists have kept mollies at some time in their experience and in fact the black molly has become quite adaptable to varying conditions in its domesticity. This is probably due to the fact that it was developed as the result of an inter-specific cross although black specimens of individual species do occur in nature. But if you are to keep the other species of molly then their special requirements need to be looked into.

Mollies have been known to science for over two hundred years now since a gentleman by the impressive name of Don Jose Anthony de Alzarte y Ramyrez sent a report to the Royal Academy of Sciences in Paris in 1769 that he had found tiny livebearing fishes during a scientific expedition to California. He wasn't exactly sure what the fishes were he discovered but it is thought that they must have been a species of molly, probably *Poecilia mexicana*.

The first real identification of a molly came in 1821 when Lesueur named *Mollienisia latipinna* (Mollien after the French Finance Minister and *latipinna* from the Latin meaning broad-finned) and since then the remaining species were discovered over the next hundred years or so.

The ten species that were known as *Mollienisias* were brought into the *Poecilia* genus by Rosen and Bailey in 1963, although aquarists have retained the common name "Mollies" from their original generic name. The fishes concerned are:

Poecilia caucana (South American Molly)
Poecilia elegans (Haiti Molly)
Poecilia formosa (Amazon Molly)
Poecilia latipinna (Sailfin Molly)
Poecilia latipunctata (No common name)
Poecilia mexicana (Molly)
Poecilia montana (Dominica Molly)





Poecilia potanensis (Spiketail Sailfin Molly)

Poecilia sulphararia (No common name)

Poecilia velifera (Yucatan Sailfin Molly)

It can be seen from some of the common names that the Mollies range over quite a large area from Guiana, Venezuela and Colombia in South America, throughout Central America and into Mexico, Texas, Florida and the coastal waters of the southern states of the U.S.A. *P. latipinna* and the common short-finned Molly (*P. mexicana*) have perhaps the biggest range covering most of central America and extending well into the United States even as far north as Virginia. *P. mexicana*, incidentally, is the latest name for the fish known formerly as *Mollienisia sphenops*.

Of the ten species three are characterized by large dorsal fins known as sailfins. *P. Latipinna* and *P. velifera* are quite common aquarium fish but *P. petenensis* is only very rarely seen. The remaining seven have smaller fins although they do vary in size from species to species.

The first Mollies made their aquarium debuts in the 1920s and early thirties, the most common one being the usual short finned *P. mexicana*, which appeared in several colours thanks to the importation of different races. Perhaps the best known being the Liberty

Molly characterized by the brilliant coloration of its dorsal and caudal fins.

Blacks were the next type to reach the market and there are varying theories as to how they came about. It is known that black "sports" or freaks do occur in the wild in both the mexicana and latipinna species (and in one or two of the others as well) and Dr William T. Innes in his famous book "Exotic Aquarium Fishes" says that the Blacks or Midnight Mollies were line bred from these and initially when they were born some were light and some were dark. Most turned light coloured at first and then began spotting black at about an inch long. The time taken to turn completely black taking anything from six months to two years, or in some cases not at all.

Through further selective breeding a strain of "permablacks" was developed which were black from birth and these went on the market in the U.S.A. in 1936.

Kurt Jacobs, however, reports a different story in "Livebearing Aquarium Fishes" although he doubts its authenticity. The black molly was apparently produced by the selective breeding over a period of seven years between *P. mexicana* and *P. formosa* by a man called Crescenty. This is rather doubtful, though as



P. formosa is something of an enigma as it only occurs naturally as females. It breeds by mating with males of either *P. mexicana* or *P. latipinna* but only produces more females. It would therefore be extremely difficult to produce a viable strain from such a cross.

However, it was developed, it still remains one of the most popular mollies today and although initial inbreeding reduced it in both size and magnificence of its fins, later development has returned it to its former glory, and even improved on the original in some cases.

Blacks were not the only development of the Mollies however, but they did not undergo the startling metamorphoses of some of the other livebearers. Most have been left in their basic livery which has perhaps been heightened in some cases, and the only colour form produced, apart from the black, has been various albinistic forms characterized by their pink eyes.

Perhaps it was because there were already sailfin types that the Molly was left alone for so long and it was not until the 1960s that the first fin variations occurred. In 1961 a Chinese dealer called Cheah Yam-meng developed the lyretail molly from a single black female which had the caudal fin with the upper and lower lobes elongated. A cross with a normal black male produced an elongation of all the fins and once the strain had been established it was bred into the natural green form of *P. velifera* and eventually into the albinos as well.

And that seems to have been it until recently. Last year one or two Singapore exporters started advertising "Balloon" Mollies which are apparently so permanently fat that they look pregnant all the time. That

this state is attractive is doubtful and fortunately (in my opinion, at least) they do not seem to have been imported in any great numbers. Whether they will gain popularity in the future, as some of the more bizarre forms of goldfish have done, remains to be seen.

A more attractive form to arrive in Britain in limited numbers was the veiltail Molly. As its name suggests the tail has been elongated and broadened, although not as much as in the veiltail guppies. It appears once again to have arrived only in the black form but it shows promise and in the hands of a few aquarists could blossom into a truly beautiful fish. Perhaps it could be crossed with a lyretail molly to widen the spread of the tail, or bred into the other species, the possibilities are endless and the future of the mollies now looks more interesting than it has done for a number of years.

Poecilia mexicana (male)



(Next: *Poecilia mexicana*—A Molly of great variety)

From a Naturalist's Notebook

by Eric Hardy

It is now the fashion to record the distribution of fishes, reptiles, plants and other fauna and flora by maps dotted with their locations, say for each 10 sq. KM. These have become an endless headache to those of us active in the field, usually when their compilers fail to contact all workers in the field. Consider the natterjack toad again. From the Borough of Barrow in Furness (Cumbria), I receive recently an excellent 86-page report by their surveyor on *The Natural Environment of North Walney (Island) and Sandscale Haws*. Here they wish to upgrade conservation, extending the special scientific area to include some pools where natterjacks breed. It details the geology, ecology, climate, fauna and flora, etc.; but a full page map of the distribution of the natterjack in the United Kingdom will confuse recorders for years to come. Sandscale Haws is the dune-marsh shore at the Duddon estuary opposite North Walney.

This marks 34 colonies, from the Mull of Galloway and 7 Solway sites, to Land's End on the west, and from Yorks and East Anglia to 8 in West Sussex-Hants. Previous maps marked 23. While it omits the Dee estuary, what astonished me most was a well marked site in Wales where all field workers are agreed that natterjacks have been extinct this century or at least since before the war. The only ever known colony was the old Clwyd estuary, whereas this dot marks the current Porthmadoc/Morfa Harlech estuary.

This official publication claimed Nature Conservancy co-operation, but when I contacted the NCC Biological Records Centre, their herpetologist kindly phoned immediately, agreeing that no authentic modern Welsh record for natterjacks exists, and if any has been proved at this site, it was either introduced or an escaped pet. Barrow's Borough Surveyor tells me he got his information from the Nature Conservancy's regional office. Viper and Adder also occur in the Report area.

Biology books fail to appeal to the average fish-keeper, not because they are above his head, but usually uninteresting, out of contact with him, or pedestrian textbook English. Not so the new 3rd edition of Prof Aubrey Manning's *Introduction to Animal Behaviour* (Arnold £12; £5.75 paperback). The main interest of its 329 pages is the wealth of example in its probing of the ways in which nerves stimulate or check signals and urges to do things, once called instinct like the laboratory stickleback turning always to red and how brightly marked tropical *Astatotilapia*

fish learn details of the female's dull markings. Its fault is that despite 23 pages of references, the index is reduced to less than 3 pages and doesn't include any of the references to fish, birds, or other animals, the best part of the book.

Konrad Lorenz's European school of studying the causes of behaviour from direct observations in the wild, imprinting, signal and release of behaviour, certainly leads over American experimental psychology assessing intelligence by unnatural laboratory tests and rewards, placing the influence of environment above heredity. Even the crudest models make a stickleback respond if they have red, where as the best models fails without that colour. A shoal of minnow panics when blood from a scratched or injured member gets into the water, because they have extraordinary sensitivity to chemicals from their own species, yet less from blood of other fish. Maybe this has a survival value. Water-snakes, and others, detect prey by smell and taste on Jacobson's organ in the roof of their mouths, flicking out their tongues to pick up chemicals from the air and taste them on Jacobson's organ. Newborn garter-snakes confronted with cotton swabs from various fish, frogs, salamanders, worms etc., always select the prey type they will hunt in the wild, even if they haven't yet fed, so the selection is inherited, not learned. This choice persists irrespective of strange prey fed to their viviparous mothers in which they developed.

Cichlasoma meeki, a cichlid fish, raises its gill-covers in threat display to another because secretion of adrenalin stimulates nerves and leads to deeper, more rapid breathing. When water containing dissolved carbon dioxide is passed through stickleback nests to mimic the effect of eggs developing, it increases the bouts of the male's fin-fanning courtship display as a displacement action. In fighting display, two *Tilapia natalensis* approach with open mouths and grip in a kissing-like action which is pulling against each other, where as a similar action by *T. mossambique* is pushing against each other. In either case the weaker fish soon breaks and flees. In similar incidents, two male *Cichlasomas* remain facing one another with gills raised to increase size and threat.

Like the stickleback demonstration, parental fanning movements are started in a bare tank devoid of nest, eggs or carbon dioxide, in isolated male fish of *Crenilabrus ocellatus* by injecting pituitary hormone, this being the master-stimulator of animal behaviour. Fish-breeders found that to get a pair of the aggressive cichlid *Etroplus maculatus* to breed, the tank needed one or two extra males for the breeding male to attack

as "whipping boys". Kept alone they rarely bred successfully because the male attacked the female instead. Like the stickleback, the male is most aggressive near his nest and must attack something. Prolonged exposure to a mirror made Siamese fighters respond less to this attacking stimulus which took days to recover. Likewise when repeated rivals were introduced to swordtails, which had to be isolated up to 8 weeks to recover their aggression. If in the absence of an opportunity to fight, aggression accumulates, then the fighting cichlid *Pelmatochromis* contradicts by decreasing the tendency to attack after a few days with no rival. This is the sort of thing which makes biology interesting and readable.

An astonishing number of insects feed on aquatic and emergent waterside plants. Of the truly aquatics, duckweed is one of the foods of the aquatic caterpillars of small and brown China mark moths, the former its own attached *Cataclysta lemnata*. It also has its own beetle *Tanyphyrus lemnae*. Potamogetons and stoneworts occasionally form food for larvae of brown China mark and its smaller relative the false caddis or water-veneer, *Acentropius niveus*. A midge, *Eucricotopus brevipalpis* feeds only on broad, floating-leaved *P. natans*. They also harbour a tiny yellow predatory bug *Mesorelia*. Water-lily aphid will attack pickerel weed as well as arrowhead.

White water-lily *Nymphaea* suffers more from insects than does yellow *Nuphar*, particularly in July-August, when leaf-mining caterpillars of tiny defoliating, brown and white mottled China mark moth, which flies to lay its eggs from June to August. Insecticide does not control this like hand-collecting. Their leaves are also damaged by water-lily aphid, *Rhopalosiphum nymphaeae* which winters on *Prunus* trees, and by their own tiny beetle, *Gelerucella nymphaeae* which feeds also on the flower. Buds, leaves, stalks and roots may be injured by creeping larvae of caddis-flies, while plants turn brown with curled leaves and stem from attacks on the root tuber by half-inch "red worm" larvae of midges, especially in a fishless pool. Such roots can be lifted, immersed in derris insecticides and replanted in a fresh site.

Water-soldier has its own little ringed China mark moth *Nymphala* (= *Paraponyx*) *stratiolata* which runs on the water and whose tiny caterpillar lives in a silk-sown case of bits of leaf. Over 50 different beetles live in Britain's ponds and ditches, another 20 or so in streams and waterfalls and over 200 more run about the water's edge, or in moss and aquatic plants without being pests. I have been interested in insects on waterplants and find the genus *Salix*, willows, sallows and osiers, hosts by far the greatest number.

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continued from page 47

million and £3 million annually—and a ten-fold growth is predicted by 1985, when the industry could produce up to 20,000 tons of trout.

It is estimated that there are about 500 large commercial fish farms in Britain today, either producing fish for the table, or for restocking natural waters.

Salmonids like rainbow trout are highly efficient converters of feedstuffs into palatable protein. No other form of intensively-kept livestock can compare with their conversion rates. It is not uncommon to get 14 oz. of trout for every pound of food supplied to it, and under ideal conditions it is possible to achieve one for one rates.

Current prices of imported fish meal is in the region of £300 per ton, therefore the results of the unit's experiments are being watched with great interest. In fact, Dr. Bromage was recently awarded £18,000, a three year grant from the Government's Natural Environmental Research Council to further this important work.

Among the aspects currently being investigated are certain types of plant food human and animal waste, and single cell proteins which could be grown, under the right conditions, in some sewerage works.

Aston's biologists are also studying the spawning habits of the rainbow trout which under normal conditions is limited to only a few months of the year, during the winter.

The biologists will try to discover how changes such as light, temperature and food supplies combine to trigger the sex hormones which control reproduction. If they get the right answers it will, hopefully, become possible to control the spawning periods of trout and, perhaps, other fish to enable their eggs to be produced on demand.

Over £1 million was spent by Government bodies, universities and other organisations on research and development into fish farming and fish disease during

1976-77—a clear indication of the importance now being placed in the industry.

For many years it was believed that a fish farm would be a "get-rich-quick" scheme for any landowner with some capital to spare and an area of low-lying ground near water, especially if it could be put to no other use. Many of those who tried were doomed to failure and got into deep water (if you will pardon the pun). In fact, during a recent conference at the National Agricultural Centre, at Stoneleigh, the figure was said to be between 90 to 95 per cent.

I recall a letter which I received some years ago from a trout farm. The owner stated that it was intended to diversify into a more lucrative branch of fish breeding to back up the commercial trout rearing side of the business, and it had been decided that fancy goldfish would be ideal. I was asked for advice upon the breeding and sorting of goldfish, and how they should set themselves up with equipment in order to stand the best chances of success. I was also asked to inform them which were the most popular varieties and where they could obtain breeding stock, and whether I thought it would be a viable venture with a good market.

No doubt my reply shattered the dream, for I told them that I did not think they would be able to make such a venture commercially viable. It was doubtful whether they would find a large market, it was even more doubtful if they would be able to produce fish at a price that would compete with the cost of imported fish. Finally, I pointed out that they would find only a small percentage yield of quality fish from the fancier varieties of goldfish—if that were the aim.

A subsequent letter informed me that enquiries made overseas had confirmed my remarks, and I was thanked for my advice, however, it had been a surprise to learn that the goldfish varieties did not breed 100 per cent true—as the writer remarked, "even the professional can learn!"

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BATFISH

by P. R. Allen

THE TROPICAL marine fishes of the genus *Platax* are all more commonly known as Batfish. There are three species which can be obtained, but only two are seen with any regularity.

Platax obicularis (Round Batfish) is generally the species most often offered for sale, is the most reasonably priced and also the hardiest of the three available species. The Round Batfish grows to a length of 36 in. in nature. Unfortunately few aquarists are in a position to keep a fish of such a size which, at 36 in. long and 36 in. deep, requires a tank of unbelievable dimensions. However, they are extremely rewarding fish to keep and can be maintained for years in any reasonably deep tank (minimum 20 in.). The body shape of this species is reminiscent of the tropical freshwater discus (*Symphysodon*). The finnage is also similar to that of a freshwater tropical, in this case the angelfish (*Pterophyllum*) this being especially true in sub-adult *P. obicularis*. Unlike most popular marine fish the Round Batfish is drab, having a basic silver background crossed vertically with four brown stripes; one through the eye, one passing through the pectoral fins, one just in front of the caudal peduncle and one just behind it. Feeding presents few problems, the fish takes all types of fresh protein (ox heart, earthworms, prawn, shrimp etc.) and most prepared fish foods (flake, freeze dried and gamma irradiated foods). Very young fish will readily take whiteworm, shredded ox heart and any of the prepared commercial foods. This diet of high protein and the metabolism of the fish, gives the batfish one of the fastest growth rates of any fish (marine or freshwater) that I have come across.

Platax teira (Long-finned Batfish) is not as common as *P. obicularis* or, at least, it is not imported so often or in such numbers. Consequently *P. teira* is rather more expensive than *P. obicularis*, but is in my opinion more attractive. They are not as hardy as *P. obicularis*; which can, if desired be introduced into freshly prepared water which is raw and unmatured.

In a matured tank where the nitrite level is negligible the "Long-finned" batfish is no more a problem than any other "specimen" fish. (e.g. clowns, hardy tangs, angels etc.). *P. teira* has a similar body shape to *P. obicularis*. The finnage, however, is magnificent; when completely developed both anal and dorsal fins are extremely elongated, being up to $1\frac{1}{2}$ x the depth of the body. The pelvic fins are also extraordinarily long, in fact often as long as the body is deep. Apparently in adult fish this lengthening of the fins is less exaggerated. (I have never seen an adult *P. teira*, so I cannot personally vouch for this fact.) Coloration is again quite drab being dark brown or grey and silver. Feeding *P. teira* is rather more complex than feeding *P. obicularis*. In my experience (I have kept four of these fish) they will only accept live foods, such as small fish, whiteworms or earthworms; or fresh protein in the form of ox heart or liver cut into suitably sized slivers. Once acclimatized to these foods their appetite and subsequent growth rate is equivalent to that of *P. obicularis*. Certain books maintain that batfish require algae to remain healthy, but none of the fish I have kept showed any desire to eat it, or spinach which was introduced for other species.

The third and most attractive species of batfish kept is *Platax pinnatus* (Red rimmed batfish). The shape and colouring of these fish is quite exquisite. Unfortunately, as often seems the case, the most desirable is also the most difficult to maintain and also the most expensive to buy. *P. pinnatus* are delicate fish and cannot stand even the slightest trace of nitrite in the water (at least for more than a few days), consequently a well matured tank, which can cope with any small mistakes in feeding, is essential. Personally I would not consider introducing one into any tank which had not been set up for a minimum of six months. In size and basic shape *P. pinnatus* is very similar to *P. teira*; although the dorsal and anal fins are broader, giving the fish a more bulky appearance. Young fish of this

species are almost entirely black with an orange stripe down the forehead and mouth. As they grow the orange deepens to red and spreads right round the fins, giving the fish its common name (Red rimmed batfish). Fully grown adult fish are approximately 24 in. long and as with the other *Platax* species at this size, totally unsuitable for most aquarium culture. As I have already stated, these fish are difficult to maintain and feeding presents quite a problem. *P. obicularis* and *P. teira* are actively predatory, that is they pursue and attack their prey, and generally will accept substitute foods fairly readily. *P. pinnatus* is also a predatory species but goes about it more after the fashion of scorpion or weever fish, in that they drift about waiting for suitable livefoods to come within range. (Scorpions (Pterois species) tend to lie in wait rather than drift



Platax orbicularis



Platax teira

with the current as *P. pinnatus*). This means that in captivity they will only take livefoods, such as suitably sized fish or, if you are very fortunate, earthworms and whiteworms. One food which they will accept is adult brine shrimp (live). It is quite a problem, though, to hatch and grow brine shrimp in sufficient numbers to maintain such a gluttonous fish.

When keeping any of the above species of batfish very efficient filtration is necessary. This is especially true with the first two species (*P. obicularis* and *P. teira*) which when being fed on heart or liver tend to be, what can best be described as, messy feeders. Keeping batfish in a community of other fish can be an advantage in that the others can pick up crumbs from their table! Care, however, should be taken that no over aggressive fish are included in the community, otherwise the placid batfish will soon be in a very sorry state. (Ripped fins repair at a fantastic rate with batfish, but of course it is preferable for none to be ripped in the first place.) It is wise to keep the amount of coral to a minimum, not only to prevent fins being damaged but also to give the fish maximum swimming space. Batfish in captivity soon become very tame and develop into real character fish (cichlid keepers find similar familiarity with larger cichlids—oscars etc.) If kept in a suitable aquarium they make delightful and amusing tank inhabitants.

WHAT IS YOUR OPINION?

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

Photographs by the Author



FIFTEEN YEARS AGO, while a none-too-rich student, I had my first article published in *The Aquarist*. During the ensuing period I have occasionally lamented the fact that many British-made aquarium cures do not disclose their active ingredient(s). Since I last made the comment—in the November, 1978 issue—I have received several letters from firms that market cures for fish diseases. One such letter reached me from Mr. R. Houlton, B.Sc., of Aquatic Chemicals, 7 Western Street, Swansea, West Glamorgan (I now wish I had opened with the "Time passes!" quotation from Dylan Thomas's beautifully-lyrical *Under Milk Wood*).

Mr. Houlton says: "... The problem of branded cures which do not disclose the active ingredient is indeed a vexed one... The hit-and-miss approach can be costly and relatively dangerous to fish. For example, cure A may react with cure B; alternatively, cure C may contain the same active ingredient as cure D and using both consecutively could result in an overdose. When I returned to the hobby six years ago, after a lay-off of many years, I found white spot was still the same old problem. However, malachite green was the saviour. Unfortunately the purchase of any new fish seemed to result in a fifty-fifty chance of introducing white spot. Malachite green never failed to cure fish which became infected. However, a 5 ft. tank requires a lot of (a branded cure). In the space of a few months a friend and I spent a small fortune on a German product. Fortunately, however, the German manufacturer is one of the few companies which do disclose their active ingredients. As a qualified chemist I realised I could formulate my own malachite green for a fraction of the cost—and have in fact used my own ever since.

"However, I agree with your comments in the January column that the average aquarist would find it a risky proposition to treat his tanks with raw chemicals. Despite Master Locke's success I doubt that one could purchase many aquatic chemicals in the average chemist's shop. Acriflavine is an exception because of its general medicinal use. The major problem of course is in formulating the correct dosage. Few aquarists probably have access to a thousand pound analytical balance and a deionization unit. Furthermore, the minimum quantities offered for sale by the manufacturers are usually far more

than the average aquarist would use in a lifetime. For example, ten litres of 2-phenoxyethanol (Phenoxetol) would treat a very large number of aquariums!

"I have become very interested in the treatment of fish diseases over the past two years and have in fact analysed most European brand cures to discover their active ingredients. Most brands examined contained one of the following active ingredients: malachite green, methylene blue, copper chelate, chloramine T, 2-phenoxyethanol or acriflavine.

Chemical Service

"Recognising the difficulties which face the aquarist in this field, two colleagues and I have set up a small laboratory with the intention of providing a chemical service to the hobby. We are offering a range of chemicals recommended in the literature or offered by the major companies as branded cures. Whenever possible we offer the chemicals as a ready-made-up stock solution with the dosage based on multiples of 5 mls. For chemicals with a limited stability in water, they are offered in ready-weighed quantities either to treat a standard 24 in. x 12 in. x 12 in. hospital tank, or else to make up one pint of stock solution. Subsequent dosage is again based on 5 mls. aliquots. I have taken the liberty of enclosing our product list. However, as we wish to offer as complete as possible a service we will endeavour to obtain any chemicals which any aquarist may require. Furthermore, we would be pleased to carry out any chemical analyses. Regrettably we are unable to carry out analyses of a biological or pathological nature as these are outside our field of expertise.

"Incidentally, I have recently returned from Zambia where I took the opportunity to have a brief look at the aquarium scene in Lusaka. I was very disappointed. The selection of fish was very poor and none of them was priced; in fact, few were named. Surprisingly, perhaps, there were few if any African species on sale. No doubt because of their transportation problems there wasn't a very good selection of dry goods. As ever (a German brand) predominated, with their medications retailing at £4 for 80 mls. Even the aquarium in the majestic State House only boasted three goldfish and two nondescript cichlids.

"Finally, I would like to take this opportunity to congratulate you on your column; long may it

continue. From a personal viewpoint, *W.Y.O.* and Eric Hardy's column are my firm favourites. Again, on a personal note, my major interest over the past two years has been native marines; and four of my six show tanks are now devoted to these. I find them absolutely fascinating and can thoroughly recommend them."

Life on Earth

Have you been watching Mr. David Attenborough's superb BBC2 series, *Life on Earth*? The fifth programme, *Conquest of the Waters*, dealt with some of the world's 30,000 plus species of fishes and contained amazing film of a wide variety of fascinating fishes—including several horrible-looking species that inhabit deep, cold water. The most moving scenes were of adult salmon which, having returned to their

when, several hours later, I went to feed my angels and discovered the elderly male happily spawning with one of the comparatively small angels. The little female spread her rows of eggs over the glass and along two leaves of Java fern; and the elderly giant, who had little space in which to manipulate himself, twisted and turned in an attempt to fertilize as many as possible. I watched the spawning from a distance and quietly left them to get on with their job. Sadly, when I returned a couple of hours later the pair had eaten their spawn and left the glass and leaves spotless. Both young and old fish seem to be in good health so I shall look forward to their spawning again in the not-too-distant future. It is little events such as the one I have described that make our hobby so unpredictable and fascinating.

Photograph 1 shows an angelfish spawning. Please



place of birth to spawn, completed the spawning act and died almost immediately afterwards. The cycle of life would be repeated when the red salmon's eggs hatched, allowing the young fry to be washed down the river into the ocean; from where, two years later, the new adults would return to the place of their birth to spawn and die.

Recently I lost one of my two, elderly angelfish that I had had for so long that I cannot even remember buying them. The survivor, a saucer-sized male showing its age, looked as if it would soon follow its female partner. Anticipating its demise I purchased three, young angels that were about the size of the top of a standard egg-cup. A couple of days ago I changed the filter wool in the power filter that keeps the angel tank spotless; and I topped up the tank with fresh water straight from the tap. I was amazed

send me details of your experience with the spawning of angels. Spawnings are not uncommon; but it's less common for the ordinary aquarist to hatch the eggs and raise the babies to maturity. Have you managed to do so?

Mosquito Fish

No. 34 Bute Avenue, Port-Glasgow, Renfrewshire, Scotland, is the home of Master James Petticrew—who writes: "After reading your magazine I decided to tell you about my experience with the keeping and breeding of mosquito fish (*Heterandia formosa*). I purchased my fish from a breeder in England who sent them to me by rail. This fish is about 2 cm. long and has a black, horizontal line running along its body, with faint vertical lines as well. I gave my fish a tank to themselves; it contained a box filter,

quite a lot of rocks, and was well planted. I had decided on the well-furnished tank to let the shoal of ten fish settle in and get them used to my looking at them. I felt that they would have been afraid without somewhere to hide. They settled in, taking their food rapidly. Like all livebearers they should be fed plenty of greens.

"About ten weeks later gravid females were spotted and taken out; but I lost the young—which were born over a period of several days—owing to premature births. However, now I have a group of fry coming along steadily and quickly. In conclusion, the mosquito fish is an excellent introduction to the rarer livebearer if you have (a) a tank to spare, for these are fragile and small; (b) patience to rear the fry; and (c) good eyesight to enjoy these tiny fish as they frolic and play in their miniature world. P.S. I should enjoy a spotlight on A.O.S. livebearer."

Piranhas

Mr. Alan Boon's address is 23 Keble Way, Blurton, Stoke-on-Trent. He informs me: "I have kept tropical fish for many years and I have a fish house containing sixteen tanks. I keep all kinds of fish and all my tanks are show tanks—not breeding tanks.

"About fifteen months ago I saw two lin. piranhas for sale in my local aquarist shop and decided to buy them to add a bit of interest to my fish house. I kept them in a 36 in. tank and before long I became a piranha addict. I began to read everything I could about piranhas and eventually moved my fish into my lounge. They live in a 48 in. x 18 in. x 15 in. all-glass tank and are now 7 in. long. They are red piranhas—*Serrasalminus nattereri*—and get on really well with each other. I have never seen a bite on either one. To me they are the most interesting fish of all. The tank is well planted and has rocks to provide cover for the fish. I keep the temperature at 76°F and use U/G filters. A 4 ft. length of porous tubing travels across the back of the tank providing a screen of very fine bubbles through which the fish like to swim. I feed them on sprats and peeled prawns which I get from my local supermarket; ox heart, and raw strips of steak which I hang on a piece of string; and dried river and white shrimps which float on the surface. When they take the floating food they cause a swirling motion on the surface of the water. I never feed them on live fish because I do not believe in senselessly sentencing a live creature to this kind of vicious death.

"I have read, in past editions of W.Y.O., comments from people saying that piranhas need live fish to survive; but I feel that I have shown otherwise. Both my fish are healthy, magnificent-looking specimens and eat with relish everything I give them. I think I am becoming quite an expert on piranhas. I have kept charts on their daily food intake, effects of temperature change, habits, water chemistry, etc. and one day I hope to breed the fish. I would re-

commend anyone who keeps tropical fish to try his hand at keeping piranhas because they are fascinating creatures. However, before one purchases these fish one should realize just how vicious they can be; they should be handled very carefully. I always use long-handled tools for cleaning the tank; and ever since one of them bit through my net I never put my hand into the tank.

"Everyone who visits our house is immediately drawn to the tank when they realize they are piranhas because everyone seems to have heard gory tales about them. One day I would like to be expert enough to be able to write a well-informed book on piranhas; and I should be pleased to hear from any fellow aquarists who would be prepared to send me details of their experiences with the keeping of piranhas in home aquaria. Does anyone know of a piranha aquarist society?"

That certain Plant

In the February edition Mr. M. E. Pullan asked why a certain plant was fairly frequently mentioned in this feature. Since his letter was published two weeks ago I have received three more requests for samples of the plant. I trust I will not receive another flood of requests until the summer holidays when I have more time to deal with them!

From Flat 3, 106 Chenton Road, Folkstone, Kent, comes the following warning written by Mr. J. G. Neal. "I am writing to W.Y.O. to warn your readers about altering the pH of aquarium water using acids. For quite a time now I have had in my tank three beautiful-looking discus. These were two browns of approximately 3 in. and a royal blue of about 2 in. They were kept in a 36 in. tank—with plain bottom—containing a couple of flowerpots and a large Amazon sword. The fish were fed four times daily on flake food, boiled spinach, ox heart and irradiated bloodworms. Water changes were effected twice weekly and the bottom was 'hoovered' every night to keep the conditions as clean as possible. Water removed was replaced with de-mineralised water which I obtained from my place of employment.

"My car was soon off the road owing to troubles so I was unable to transport water home; so water changes were effected using water straight from the tap—GH 19, KH 7, pH 7.6. Although the fish were still very healthy, the pH had gone from 6.6 to 7.6—which was getting a little too alkaline for discus. Now, as you may well know, water can be acidified to lower than 7.0 using peat only if the carbonate hardness is lower than 3°; so I had to think of an alternative. In many books you can find suggestions for lowering the pH by using acids such as phosphoric, tartaric or acetic; so I purchased some tartaric acid from a chemist's shop. On doing a water change I added a little of this acid—which dropped the pH to neutral—7.0. I then fed my fish on boiled spinach

and all three looked in tip-top condition and fed well.

"Next morning all fish looked well and were fed with flake food; as usual they fought at the feeding place. Then disaster started to strike. Around 10:00 a.m. the water started turning foggy; but the fish were still all okay. Soon they were swimming at the top, obviously in distress. My wife, not knowing what to do, unplugged the tank as she thought that the thermostat might have stuck causing the water to get warmer and warmer. This was not so. The fish then shot round the tank in a wild frenzy, swimming upside down and twisting about. The royal blue went first, closely followed by the browns, together, which just collapsed and died.

Disaster

"This all happened while I was at work—and believe me it was heart-breaking to walk in from work to see my discus on the bottom of the tank, dead. The fish had cost me £23.00! I am now left with nothing, all because I played around and made a stupid mistake with acid. My wife is expecting our first baby so I cannot afford to buy any more discus. They were the only fish that interested me—and I've lost them. I've learnt my lesson: use peat and play safe unless it is really necessary. I should be pleased to receive any comments about my disaster. If any discus breeders have any young, I have books and records for a swap, perhaps. I should be interested to hear." (I've published my personal findings about the use of phosphoric acid as a water softener and acidifier in occasional articles in the past. The safest place for very dilute acetic acid—vinegar—is on chips; undiluted acetic acid—known as glacial acetic acid—can produce severe burns on one's skin. I should not recommend the use of such acids in the aquarium unless you know exactly what you are doing. B.W.)

Mr. P. J. Seymour's address is 9 Derwent Court, Balderton, Newark, Notts. His subject is white clouds. "I used a tank measuring 12 in. × 12 in. × 6 in. deep, containing a 3 in. depth of normally-hard tap water—pH 6.8; temperature 78°F—treated with tapwater conditioner for breeding. Artificial plants were made from strips of boiled lace fixed to cork. In the tank I placed one male and one full female in mid-afternoon. The fish had spawned next morning. With the parent fish removed, the eggs were left to hatch—which they did within one to three days. The first food used was Liquifry. After three weeks the fry were moved on to Aquarian flake food forced through a very fine net. After about a month the young fish were moved to a 36 in. × 15 in. × 12 in. tank to grow on the same flake food and small *Daphnia*. At six months old they were large enough to sell, or give away."

Duckweed

My thanks to Mr. Graham Smith, of 48 Firsby Court, Hamlington, Middlesborough, Cleveland, who sent me some duckweed. In his letter he wrote: ". . . I obtained some duckweed in a collection of plants I ordered from a mail order company. I was quite pleased with the other plants and hardly noticed the duckweed. However, two weeks later it had set itself up strongly on the surface of the water. At the time of writing it has covered the surface of the water in my community tank; and despite frequent and severe culls I cannot control it. If any of your readers send me a s.a.e. and polythene bag I will gladly send them a portion. My favourite fish are anabantids; and after recent successes with Siamese fighting fish I have decided to try my hand at *Colisa lalia*. I have set up an 18 in. × 12 in. × 6 in. tank and am currently waiting for my fish to reach breeding condition." (I must be honest and admit that I placed Mr. Smith's gift of duckweed in my waste bin—for the simple reason that I spent a very long time ridding all my tanks of duckweed plants and I do not want to re-introduce any *Lemna* species into them because these plants reproduce very quickly in many tanks and quickly cover the water surface and prevent the top light from reaching bottom-rooting plants. It's very difficult to eradicate *Lemna* species from a planted aquarium; probably the best method is to skim it from the surface using a fairly-fine meshed net. Sheets of clean newspaper drawn across the surface can also remove many duckweed plants; but usually a few remain to reproduced and re-cover the water surface. Duckweeds are interesting because they produce the smallest flowers of which I know. Some species of fish like to eat duckweeds—but I'd prefer to keep duckweeds out of my decorative tanks. However, that's only my personal opinion based on my own experiences over the years. B.W.)

Flowering Plants

From 40 Barra Crescent, Fraserburgh, Aberdeenshire, comes the following letter—written by Mr. R. Moyes. "With reference to your February issue I should like to give my opinions on flowering plants and firms that supply them. Firstly, my *Cabomba* plants, housed in a 24 in. × 12 in. × 15 in. all-glass tank, have successfully flowered since I purchased them a few months ago from a nursery in England. I also bought five *Vallisneria*, two *E. densa*, six *Ludwigia*, six *Hygrophila polysperma*, two portions of hairgrass and an unidentified bulb with lily-like leaves.

"They are situated round my heater which is set at a constant 78°F, and they receive approximately fourteen hours of artificial light daily. The plants are anchored in medium gravel that is 3 in. deep at the rear, sloping to 1½ in. at the front. In my opinion the success that I have had with them and my other

plants is a result of a U/G filter feeding the roots with detritus. I cannot praise this piece of equipment highly enough.

"Finally, the firm that supplied me with such excellent stock in the first place—E. Palmer & Son of Hull—will continue to receive my custom in the future for the reasons given; and the fact that there is no first-class retail establishment in my local—or indeed surrounding—area. I am green with envy when I browse through your magazine and see the excellent selection of large and apparently well-run professional establishments south of the border." (I'm not so keen on U/G filters and have not used them in my decorative tanks for many years; but that's only my opinion.)

Photograph 2 shows yours truly looking at some of



my fish. If the photograph looks a little contrived it was contrived because I took the photograph—and photographing oneself with one's fish tanks is a little difficult.

I shall resist the temptation to indulge in any puns in connection with the next letter—written by Mr. David Saltinstall, of Lyndale, Derby Road, Stretton, Burton-on-Trent, Staffs. Prompted by the feature in the October, 1978 edition Mr. Saltinstall writes about the keeping of British marines. "I have kept a small coldwater marine aquarium for about four years now and have still got the original inhabitants—some common periwinkles—living happily. Soon after I had them I saw many small periwinkles in the tank; but these were quickly eaten by hungry gobies.

April, 1979

"I have found that I can only keep gobies for about 10-12 months at most. Has anyone else had experiences with them? I have managed to keep red seaweeds for about one year but after this they seem to disappear. As I live in the Midlands I cannot use natural sea water so I use artificial sea water instead. I also use a U/G filter and an airstone. I find that British marines are undemanding as far as pH, nitrites and salinity are concerned—as long as these are not allowed to get out of normal limits. The aquarium is situated in an unheated conservatory shaded from direct sunlight.

"At the moment I am setting up an experiment to acclimatize three-spined sticklebacks—*Gasterosteus aculeatus*—to salt water as I have read that they do well in it. Has any other aquarist had experience of this

species in coldwater marine aquaria?

"Finally, would any aquarist who has kept coldwater marines like to write to me or W.Y.O. to express his or her views on the subject? I feel that this side of the hobby is sometimes neglected."

Master Robert Simpson's address is Ivy Farm, Great Horwood, Bucks. He thinks *The Aquarist & Pondkeeper* is a really great magazine and cheap at the price. Robert started what he calls "this totally-absorbing hobby" with a gift of a tank and the basic apparatus needed to set it up. He writes: "I have a small 18 in. x 10 in. x 10 in. tank, and it has among its various inhabitants a pair of dwarf gouramies, several white cloud mountain minnows, one silver hatchet fish and an unidentified loach.

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Boiled Bark

"At first, in a tank of the proportions of mine, the large heater was the most eye-catching thing there—until I found a suitable method of disguising it. I found a log, of 4-5 in. in diameter, in a wood after a heavy fall of rain. The bark was very easily peeled off the log in one piece; and then I cut it so that only about three-quarters of the rounded bark, in circumference, remained. I boiled this for approximately half-an-hour in a solution of salt and potassium permanganate until water-logged. This is now upright in my tank and very much part of the decor. I had my fears that it might break down and pollute the tank; but no; all is well. It has retained its shape and firmness perfectly. Recently I added some twigs of suitable shape; these are very attractive.

"This method is much cheaper, more realistic and variable than bought imitation wood. I hope some people will find this of some use. This method could also be used to hide air-lift tubes etc. Recently I added some small pieces of coral to my tank for decoration. Are these all right for the fish? They seem to be fit and happy; and my plants have really produced shoots. Before I added the coral I soaked the pieces in a strong, hot solution of potassium permanganate, then rinsed them in fresh water to clear the pink colour.

"I have had no disease in my tank so far, in over a year, and I never change any water except topping up what has evaporated; nor do I quarantine any new arrivals. The only problem I may have had so far is a spotty algal growth on the lower half of my glass. I have tried razor blades etc.—but it has stood firm. My seven suction cups are still soft; none has broken down and none looks as if it is about to.

"One of my pair of goldfish—both males, I think—has very recently become distorted in shape. Around the anus area the whole body bends in a U shape. I am almost certain it is not full of eggs on account of the area. The anus is at the bottom of the dip. I hope you may enlighten me on this subject. The fish is fit, eating well and not suffering from constipation. My preaching of the many interesting facets of tropical fish has resulted in one more person joining the ever-increasing numbers in the aquatic hobby. Here's hoping for more!" (Robert, who is 13 years old, has raised some interesting points. Have any other readers added home-cured, forest wood or twigs to their tanks? I shouldn't recommend this unless one is sure that the species of trees used are not harmful to fishes or aquatic plants. The 'cured' coral may not do any apparent harm but coral should be avoided in tanks where one wishes to maintain soft, slightly-acidic water. I'm not an expert on goldfish so I can't give a valid answer. Your fish may be a female full of eggs. If the fish seems fit and

happy it would probably be best left alone; or you could send your query to either of the experts—Messrs. Boarder or Hems. All queries should be accompanied by a s.a.e. Rubber and plastic suckers don't seem to last very long in my tanks—with the exception of a couple of large ones that I got from a manufacturer in the south of England. Clear plastic ones seem to become hard and useless; and coloured ones—specifically blue—tend to disintegrate and dissolve. Obviously there are some clear ones and coloured ones that do not deteriorate so quickly. What are the longest-lasting brands of which you know? B.W.)

The last letter that I can accommodate in this month's feature was written by Mr. Daniel Bennett, of 24 Blackshaw Road, Old Glossop, Derbyshire. He said: "Thank you for printing my last letter in the February issue. Unfortunately, before readers' letters requesting a plant sample reached me my *Ophronemus goramy* had eaten all the plant! However, I did send everyone a piece of Java moss.

"Our Aquarist Society has only six members; as far as I know it must be the smallest society in Britain. At present we are trying to get members because the club money is beginning to run out.

Small Society

"You also asked about conditioning fishes for shows. I feed all my fish, for two weeks before the show, on bloodworms, *Daphnia* and white worms. I have heard that some people put a little vinegar in their characins' show jars; this makes the water very acidic and the fishes' colours improve. Of course this usually kills the fish because the water conditions change very quickly.

"About three-and-a-half years ago I bought a green iguana. It was about 8 in. long when I bought it and, in the one-and-a-half years that I had it, it grew to just over 2 ft. long. When it died I tried to get another; but no shops round here sell these creatures. If any of your readers know from where I could get one I should be pleased to hear from them." (It's been a popular month for vinegar and fish. No doubt I've already told you that on one occasion, in an aquarium in the previous school in which I taught, I found a couple of chips lying on the gravel. Fortunately I removed them before they began to decompose. Perhaps I should have added a little vinegar to the fish and chips in the tank! B.W.)

On that sour note I had better round off this feature with a few topics for discussion. Please send me your views on any of the following: (a) breeding cardinals; (b) feeding aquarium plants; (c) the effects of lighting on fishes' behaviour; (d) cultivating various worms for fish food; (e) methods of earning money to boost club funds; and (f) the effects of temperature changes on the spawning behaviour of specific species of fish. Good-bye until next month.



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

RESULTS of the Priory Leg of the Three-Corner Show held at the Terminus Club, North Shields on 25th January:

Breeders (Egg): 1, G. Thompson (M.P.A.S.); 2, D. Hulme (M.P.A.S.); 3, B. Turrell (M.P.A.S.). Corydoras and Brochis: 1, Mr. and Mrs. Risbridge (Novo's); 2, Mr. and Mrs. M. Hall (Novo's); 3, C. Hutton (Priory). Large Barbs: 1 and 3, C. Hutton (Priory); 2, Mr. and Mrs. P. Caddle (Novo's). Male Guppy: 1, Mr. and Mrs. Risbridge (Novo's). Female Guppy: 1 and 2, C. Hutton (Priory). Platy: 1 and 2, R. Kirkup (M.P.A.S.); 3, D. Hulme (M.P.A.S.). Sword Tail: 1, W. Walton (Priory); 2, C. Hutton (Priory); 3, J. Johnstone (Priory). A.O.S. Tropical Egglayer: 1, K. Kirkup (M.P.A.S.); 2, Mr. Hunt (Novo's); 3, Mr. and Mrs. M. Hall (Novo's). E.L.T.C.: 1, R. Kirkup (M.P.A.S.); 2, G. Thompson (M.P.A.S.). Loach: 1, K. Dobbie (Priory); 2, A. Bloomfield (M.P.A.S.). Betta Splendens: 1 and 2, W. Walton (Priory); 3, Mr. and Mrs. Risbridge (Novo's). Large Characins: 1 and 3, Mr. and Mrs. M. Hall (Novo's); 2, Mr. and Mrs. R. Hamblin (Novo's). A.O.V. Labyrinth: 1, Mr. Hunt (Novo's); 2, K. Dobbie (Priory); 3, D. Hulme (M.P.A.S.). Rasbora, Danio, W.C.M.M.: 1, R. Kirkup (M.P.A.S.); 2, Mr. and Mrs. Risbridge (Novo's); 3, Mr. and Mrs. P. Caddle (Novo's). R.V. Gichlids: 1 and 2, Mr. and Mrs. P. Caddle (Novo's). Sharks and Labee: 1, Mr. and Mrs. M. Hall (Novo's); 2, C. Hutton (Priory); 3, Mr. Hunt (Novo's). A.O.V. Coldwater: 1, Mr. Hunt (Novo's); 2, D. Hulme (M.P.A.S.); 3, Mr. and Mrs. Risbridge (Novo's). Small Barbs: 1, Mr. and Mrs. Risbridge (Novo's); 2, A. Bloomfield (M.P.A.S.); 3, J. Bloomfield (M.P.A.S.). Gurnish: 1, Mr. and Mrs. M. Hall (Novo's); 2, K. Dobbie (Priory); 3, J. Bloomfield (M.P.A.S.). Breeders Pairs (Egg): 1, Mr. and Mrs. P. Caddle (Novo's); 2, Mr. and Mrs. Risbridge (Novo's); 3, R. Kirkup (M.P.A.S.). A.O.V. Livebearer: 1, B. Turrell (M.P.A.S.). Small Characin: 1, R. Kirkup (M.P.A.S.); 2, K. Dobbie (Priory); 3, Mr. and Mrs. M. Hall (Novo's). Molly: 1, Mr. Hunt (Novo's); 2, R. Kirkup (M.P.A.S.); 3, P. Hutton (Priory).

Points: Novo's, 57; M.P.A.S., 41; Priory, 33.

THIS year the Ichiban Ranchu Society are introducing an exciting new idea for their show at St. Paul's Church Hall, Chigwell Road, Woodford Bridge, Essex on 20th October. A new perpetual challenge shield has been put up for toazi (this year's loach) bred by exhibitor. Accompanying this shield will be a cash prize of 75% of the total entry fees received for this trophy. Already they have enough entries to put up a cash prize of £30 and further entries will, of course, increase this amount. All this cash will be awarded to the highest pointed fish entered. The entrance fee is £5 for each fish entered.

The closing date for entries is the 7th April—post dated or at the A.G.M. of the I.R.S. the same date. All entries and enquiries to: Gary Lewis, 91 Bourne Avenue, Hayes, Middlesex. Phone: 01-573 1770.

OLD friends of the Guildford and District Aquarists' Club will be glad to hear that the club now has a new permanent home at the Merrow Village Hall, which is about five minutes from Guildford town centre on the Epsom Road (by car).

Meetings are on the second Wednesday of every month and start at 8.00 p.m. In March they welcome Ron Forder, plant man extraordinaire, to tell in particular about Apogonids, and casual visitors will be very welcome. More details from Charles Smith, Godalming 24792 (evenings). Next meeting, 14th March.

AT the annual general meeting of the Macclesfield A.S. the following officers were elected: chairman, B. Goddard; vice-chairman, J. Sutherland; treasurer, Miss S. Goddard; secretary, R. N. Merton, 21 Cumberland Street, Macclesfield, Cheshire; show secretary, P. Tomlinson, 14 Miner Avenue, Lyane Green, Sutton, Macclesfield, Cheshire; committee, Mrs. D. Goddard, W. Tomlinson; Mrs. M. McCracken, M. Roberts, M. Morgan; R. Few. Meetings are now held at the "Nags Head" Hotel, Macclesfield, the last Tuesday in each month. This year the open show will be held on the 20th May; further details can be obtained from the show secretary.

AT their February meeting, Basingstoke A.S. celebrated their 25th anniversary. Many guests were on hand to help with the festivities, and many members (both past and present), together with visitors from neighbouring societies and FRAS 'celebrities' were happy participants in a champagne party. Equally colourful was a poster competition, organised to promote the society's activities, and the winning entry will soon be seen around the town. It is hoped that this will help swell the membership and provide some new faces in the society's ranks.

Meetings are held at the Wear Street Club, Basingstoke, Hants., on Friday evenings at 8 p.m. Newcomers are warned that already there is plenty to do, preparing the society's tableau entry for the Alexandra Palace Fish Show in July, in addition to all the other aquatic activities, so why not get the next 25 years off to a good start by coming along and joining the 'Stokey' gang?

Ealing and District A.S. now meet once a month (the first Tuesday) and a recruiting drive is planned for the early months of '79. Anyone in the borough who is interested in fishkeeping is welcome to come along to the society's meetings to see what they get up to, and there is no obligation to join (although it is sincerely hoped that newcomers will find it worth staying). All the usual fishy goings-on are perpetrated, and the meeting place at the Northfields Community Centre, Northcroft Road, Ealing, W.13 is easy to find. Secretary Bob Sellers (3a Lady Margaret Road, Southall, Middlesex), will be pleased to welcome you. Hope to see you soon!

P.S.—Why not bring a friend?

KOI-KEEPING, pond construction and filtration were the subjects of an illustrated talk recently given to Peterborough Fishkeepers Association by Mr. Eric Allen, former chairman of The British Koi-Keepers Society.

The hall was full to hear various facets of keeping Koi explained in detail, accompanied by slides taken during the building of ponds and filter systems in the Allen garden. Pictures of Japanese Koi, ponds and gardens followed to illustrate the scene in Japan.

After the interval, Mrs. Hilda Allen, a former secretary of the B.K.K.S. and now

feature writer in the *Aquarist and Pondkeeper* explained the finer points of a Japanese film showing an All-Japan Koi Show held in Tokyo. The scale and organization of this show, involving 2,800 Koi, some of which had been brought 500 miles to compete, was a revelation.

The film showed the Koi being measured and photographed before being placed in their appropriate vats according to variety or size. During the judging, which took two days, large Koi up to 2½ feet long were seen being gently carried to other vats in the arms of stewards (no nets) as they, by process of elimination, moved towards the coveted awards. The champion Koi was a superb Taisho-sanke, about 30 inches long, owned by Mr. Shirokawa of Ehime, who was awarded the flag of honour for his district before happily staggering away under the weight of his gigantic Champion's trophy.

Thanks to Eric and Hilda for a most entertaining evening and to the B.K.K.S. for loaning the Japanese film.

THE first table show of the year of the Brighton and Southern A.S. was held on 5th February. It was judged by Mr. C. Pannel of Hastings. Results: Class M: 1 and 2, Mr. and Mrs. Ramshaw; 3, F. Hine; 4, S. Smith. Class F: 1, 2 and 3, Mr. and Mrs. Raggo; 4, Mr. and Mrs. Ramshaw. Class L: 1, Mr. and Mrs. Ramshaw; 2, R. Hard, 3 and 4, Mr. and Mrs. Sayer.

Meetings are held on the first and third Monday of each month at the K and T Social Club, Portlade. New members are always welcome.

South East Cornwall A.S. meet monthly on the 3rd Monday, at Linkard Long Room (except August). Visitors on holiday in this area are very welcome. Also guest speakers. For details contact Secretary, Mrs. H. Byford, 24 Humphries Close, St. Cleer, Linkard, Cornwall (Linkard 42384).

AT the A.G.M. of the Nailsea and District A.S. the following were elected to hold office for 1979: chairman, W. E. Holland; vice-chairman, P. Fitchett; secretary, Mrs. G. V. M. Ellick, 3 Burrington Close, Nailsea, Bristol; treasurer, R. J. Walters; programme officer, D. Kenwood; P.R.O., M. J. Ellick; committee members, C. P. Brewer, R. Hall.

The club meets on the second Tuesday of each month at the "Highlife Hotel", Clevedon. All welcome.

NEW OFFICIALS of the North Staffordshire A.S. are: chairman, R. Machin; secretary, Mrs. B. Van Bakel, 150 Oxford Street, Penkthill, S.O.T., Staffs. (tel: S.O.T. 47892); show secretary, P. Coson, 22 Charter Road, Newcastle-under-Lyme, Staffs.

AT their annual club show on 10th February, Tongham Aquarists were well supported by all club members, and they were pleased to welcome as judges Mr. Roger Payne and Mr. Adrian Blake, from Basingstoke A.S.

Tongham Aquarists meet on the first and third Thursday of every month at the Central Club, Farnham, Surrey at 8 p.m., and new members are always welcome. Each month they have guest speakers, slide shows or open meetings, in most cases accompanied by a table show. Any interested acquaintances should contact R. Cooke (Tel: Aldershot 20863) or S. Swain (Tel: Aldershot 311582).

Results of the club show were: Class Ag (Miniature Furrowed Aquaria): 1 and 2, M. Bird; 3, R. Cooke. Class B: 1 and 2, B. Hicks (Barbus fasciatus) and Barbus filamentosus; 3, R. Cooke (Barbus tetrazona tetrazona). Class Ca: 1, K. Wraith (Hyphessobrycon rubrostrigatus); 2, R. Cooke (Hyphessobrycon scholzei); 3, B. Church (Mimigrammus caudovittatus). Class Cc: 1, S. Bird (Anopichthys jordani); 2, R. Cooke (Martiensia nigripinna); 3, M. Bird (Microlestes interruptus). Class Dc: 1, M. Bird (Pterophyllum altum). Class Dd: 1, S. Bird (Primateochromis pulcher). Class Dc: 1, M. Bird (Tropheus trophoeus); 2, B. Church (Pseudotropheus auratus); 3, P. Edwards

(Pseudotropheus macrophthalmus); 4, R. Cooke (Tropheus trophoeus). Class C: 1 and 3, M. Bird (Steatocranus casuarus) and (Cichlosoma cyanogetatum); 2, S. Bird (Aequidens curvipes). Class E: 1, S. Bird (Trichogaster microlepis); 2, M. Bird (Trichogaster leeri); 3, K. Wrath (Trichogaster opaline). Class Ea: 1 and 3, S. Bird (Beta splendens); 2, P. Edwards (Beta splendens). Class F: 1, 2 and 3, M. Bird (Aphyosemon bivittatum bivittatum), (Aphyosemon stoeckii) and (Aphyosemon serebi). Class G: 1, A. Willatts (Hoplasterium littorale); 2, S. Swann (Pseudomelodius ranina ranina); 3, T. Trusler (Ancistrus dolichopterus). Class H: 1, A. Willatts (Corydoras paleatus); 2, B. Hicks (Corydoras reticulatus); 3, A. Belcher (Corydoras blochi blochi). Class J: 1, 2 and 3, R. Cooke (Rasbora heteromorpha). Class K: 1, A. Willatts (Brachydanio frankel); 2, M. Bird (Brachydanio frankel). Class L: 1, A. Willatts (Cobitis taenia); 2, C. Lambert (Acontophthalmus myersi); 3, K. Wrath (Acontophthalmus kishi). Class M: 1 and 2, M. Bird (Mastacembelus erythrotania) and (Mortulius chrysokeadon); 3, B. Hicks (Oryzias latipes). Class Ma: 1, C. Lambert (Labeo erythrorus); 2, S. Swann (Labeo bicolor). Class Nbm: 1, M. Bird (Pseudotropheus macrophthalmus); 2, R. Cooke (Barbus arulius); 3, M. Mitchell (Barbus arulius). Class Not: 1 and 3, A. Willatts (Poecilia reticulata) and (Xenotoca eiseni); 2, M. Bird (Xenotoca eiseni). Class O: 1 and 2, M. Bird (Poecilia reticulata); 3, A. Willatts (Poecilia reticulata). Class P: 1, M. Bird (Poecilia reticulata); 2 and 3, A. Willatts (Xiphophorus helleri); 3 and 4, T. Trusler (Xiphophorus helleri). Class R: 1, A. Willatts (Xiphophorus maculatus). Class S: 1, M. Bird (Poecilia latipinna); 2, M. Hicks (Poecilia velifera). Class T: 1 and 3, M. Bird (Girardinus metallicus) and (Ameca splendens); 2, A. Willatts (Gambusia affinis affinis). Class U: 1 and 3, P. Edwards (Single tail goldfish); 2, A. Willatts (Comet). Class V: 1, P. Edwards (Twin tail goldfish); 2, M. Hicks (Oranda). Class W: 1, M. Hicks (Rhodeus amorus). Class Xbm: 1 and 2, M. Bird (Julidichromis transcriptus) and (Haplochromis venustus); 3, R. Cooke (Haplochromis bartoni). Class Xot: 1 and 3, M. Bird (Xiphophorus helleri) and (Poecilia reticulata); 2, S. Bird (Ameca splendens).

AT the annual general meeting of **Petersfield & District A.S.** the following were the officers elected: chairman, G. Barkham; secretary, W. F. J. Crookford, 29 Durdord Road, Petersfield, Hants GU31 4HR; treasurer, N. Harrison; show manager, L. Yates; show secretary, G. Stacey, 6 Highfield Road, Petersfield, Hants. The retiring chairman thanked everyone for their help during his year's office. The secretary's and treasurer's reports showed that all ventures undertaken during the year produced a profit. The newly elected chairman thanked the retiring chairman for his guidance and help in his three years of office.

NEW officers of the Aveborough and District A.S., elected at the a.g.m. on 10th January, are: chairman, J. Upton Hall; vice-chairman, P. Smith; treasurer, S. Chaffer; secretary, R. Stephens; show secretary, R. Shaw. Meetings are to continue on the first Tuesday every month at 8 p.m. at Greenside Hall, Rawdon. They are alternating between lectures and sideshows and table shows and quizzes. Trips are organised to shows and they try to encourage the more experienced members to help beginners.

AT the February meeting of the **Thorpe and District A.S.**, over 100 members and guests were entertained by an excellent lecture by Mr. Derek Littlefield, of Moneysave Nurseries, on aquatic plants. The evening closed with an auction of over 50 lots of fish.

Over 50 entries were benched in the table show and class winners were as follows: Class 1 (Characin): 1, Mrs. Hodgson (Bleeding Heart Tetra); 2, T. Cook (Serpae Tetra); 3, P. Spaakes (Cardinal Tetra). Class 2

(Guppies): 1, Mrs. Crooks; 2, G. Balls; 3, R. Knights. Juniors: 1 and 2, D. Hurn (Congo Tetras); 3, J. Norton (Blind Cave Tetra).

Meetings of the society which cover all aspects of the hobby are held on the first Wednesday of each month at the Canary Public House, Heartsease, Norwich at 8 p.m. New members are welcome. Membership enquiries to Trevor Cork (Norwich 416052).

Weymouth A.S. has been reformed and the following committee members elected: chairman, G. Fitzgerald; secretary, C. Stratford, 10 Chafeys Avenue, Weymouth, Dorset; treasurer, J. Fancy.

Meetings are at 8 p.m. on the second Wednesday of every month at the Moose Hall, Chickering Road. New members are welcome and the Society would be pleased to see those former members who supported the club so well in previous years. For further information ring S. Benson (Weymouth 4516).

AT the a.g.m. of the **Mid-Sussex A.S.** held at the "Fox and Hounds," Haywards Heath, on 8th February, Mr. N. Short presided in the absence of the president, Mr. D. Soper. The outgoing chairman, vice-chairman and secretary expressed their thanks to those who had worked for the club in the past year.

The membership secretary reported that enquiries were coming in and it was hoped that the membership would increase in 1979.

The outgoing chairman, Mr. N. Short did not stand for re-election, so ending a long spell on the committee of the Society. He was elected a vice-president.

The following were elected to the committee for 1979: chairman, J. Burtles; vice-chairman, W. Slade; secretary, J. Birch, 11a Sandrocks Way, Haywards Heath, W. Sussex (tel: H.H. 50585); treasurer, R. Young; show secretary, T. Tester; committee, Messrs P. Levine, W. Perrin, L. Pinney and Miss S. Tester.

A PRACTICAL demonstration on "Making Aquariums" was given to the **Evesham Fishkeepers' Society's** February meeting by its chairman, B. R. Goll. This was followed by an open discussion on the society's second open show scheduled for the 9th September. The table show featured male and female guppies. Results: Males: 1, S. Biddle; 2, Mrs. J. Hessel; 3, Mrs. E. Thornton. Females: 1, Mrs. E. Thornton; 2 and 3, S. Biddle.

The Society meets on the first Wednesday of every month at 8.00 p.m. at the Hampton Scout Hut, Pershore Road, Evesham. Visitors and new members welcomed. Club secretary M. Pattison, 22 Dudley Road, Honeybourne, Evesham, Worcs. (phone: Evesham 831415).

THE committee elected at the annual meeting of **Oldham and District A.S.** was: chairman, R. Colley; treasurer, Mrs. E. J. Brunt; secretary, G. Mellor, 152 Bircol Lane, Manchester 10 (tel: 061-691-5426); show secretary, P. Harris, 21 Richardson Road, Eccles, Nr. Manchester (tel: 061-707-1395); public relations officer, A. Chadwick, 9 Bronville Close, Chadderton, Oldham (tel: 061-652-6207); librarian, D. Hulse; finance officer, K. O'Rourke. It was agreed that a change of venue should be made and meetings are now held every other Monday at 8 p.m. at The Springbank Hotel, Hunt Lane, Chadderton, Oldham, where old and new members will find a very warm welcome.

RESULTS of the Inter-Club Show, second leg, between **Novos' T.F.C., Priory A.S.** and **Mount Pleasant A.C.** at The Terminus Club, North Shields, Tyne and Wear, on 21st February:

Class B: 1, B. Risbridger (Novos), 73 points 2 and 3, J. Johnstone (Priory), 67 and 63. Class Ba: 1, J. Best (Priory), 71; 2, C. Hutton (Priory), 71. Class C: 1, Mr. and Mrs. Hall (Novos), 73; 2, B. Risbridger (Novos), 73; 3, J. English (Novos), 68. Class Ca and b: 1, Mr. and Mrs. Hall (Novos), 80; 2, B. Risbridger (Novos), 77. Class D: 1, G. Hunt (Novos), 71; 2, C. Hutton (Priory), 62;

3, G. Thompson (M. Pleasant), 58. Class Dc: 1, P. Caddle (Novos), 71; 2, W. Walton (Priory), 70. Class Db: 1, C. Hutton (Priory), 73; 2, G. Thompson (M. Pleasant), 69. Class E: 1 and 2, G. Thompson (M. Pleasant), 58 and 52. Class Ba: 1 and 2, W. Walton (Priory), 70 and 68; 3, B. Risbridger (Novos), 65. Class F: 1, B. Risbridger (Novos), 71; 2, R. Kirkup (M. Pleasant), 68; 3, Mr. and Mrs. Hall (Novos), 65. Class G: 1, B. Risbridger (Novos), 68; 2, Mr. and Mrs. Hall (Novos), 63. Class H: 1, R. Kirkup (M. Pleasant), 71; 2 and 3, C. Hutton (Priory), 70 and 69. Class J and K: 1, R. Kirkup (M. Pleasant), 73; 2, P. Caddle (Novos), 68; 3, A. Robinson (Novos), 67. Class L: 1, P. Caddle (Novos), 65. Class M: 1, R. Kirkup (M. Pleasant), 77; 2, Mr. and Mrs. Hall (Novos), 66; 3, G. Hunt (Novos), 65. Class Ma: 1, G. Hunt (Novos), 64; 2, J. Johnstone (Priory), 64. Class O: 1, B. Risbridger (Novos), 74; 2, R. Kirkup (M. Pleasant), 70; 3, P. Caddle (Novos), 66. Class P: 1, C. Hutton (Priory), 78; 2, B. Risbridger (Novos), 72. Class Q: 1 and 2, W. Walton (Priory), 79 and 77; 3, C. Hutton (Priory), 68. Class R: 1 and 2, R. Kirkup (M. Pleasant), 83 and 71. Class S: 1, A. Robinson (Novos), 73; 2, P. Hutton (Priory), 73; 3, G. Hunt (Novos), 68. Class T: 1, J. English (Novos), 82; 2, R. Kirkup (M. Pleasant), 76. Class Not: 1, J. English (Novos), 83; 2, R. Kirkup (M. Pleasant), 73. Class Nbm: 1, J. English (Novos), 76; 2, J. Johnstone (Priory), 69. Class Xot: 1, R. Kirkup (M. Pleasant), 77; 2, J. Johnstone (Priory), 68.

Best fish in show: female *Brachyrhaphis rhaphidophora*, owned by J. English of Novos. Points total: Novos, 62 points; Priory, 41; Mount Pleasant, 33.

CHANGE of officers of the South Park Aquatic (Study) Society: chairman, G. Herring; hon. secretary, Mrs. M. Dudley, 163 South Park Road, Wimbledon SW19 8RX. (Tel: 01-540 5662); hon. treasurer, Mrs. N. Lewis; show secretary, L. Clapp. The coldwater club meets at Wimbledon Community Centre, St. Georges Road, Wimbledon SW19 every third Tuesday. New members welcome.

AT the second February meeting of the **Brighton and Southern A.S.**, the first leg of the Novice Trophy was held. It was judged by Mr. T. Ramshaw. Results: 1, Mr. and Mrs. Hills; 2 and 3, S. Smith; 4, Mr. and Mrs. Raggio. The show secretary commented on the number and high standard of fish entered. Well done novices. Also a talk, given by Mr. R. Hard on "Furnished Aquariums", was well illustrated with many practical demonstrations and useful tips from the expert who has won many AG classes. The club has tapes and slides for hire to societies. Information can be obtained from C. A. Raggio, 90 Bevendean Crescent, Brighton, Sussex.

Dunfermline and District A.S. held their annual a.g.m. in the Netherdown Institute, Dunfermline and another successful year was reported, both by the secretary and treasurer, with the club's open show proving to be one of the highlights of the year on the Scottish aquarist's scene. The open show trophy was won by A. Rodger, with club members winning a total of 87 firsts, 61 seconds, 50 thirds and 14 fourth places at thirteen shows, plus a total of fifteen trophies. The club itself was awarded three trophies for the club with the most points. At the club's own open show members won a total of ten firsts, eight seconds and eight thirds also one trophy. The silver tankard for the member with the most points was won by Ian Henry.

New Forest A.S. held a successful February meeting at their regular venue, Community Centre, Lymington, Hants. The main item was a talk by a member, Bob Menhennett, on his own experiences in tropical fishkeeping. He illustrated this by displaying some of his own fish, and during the evening divulged some of his tricks of the trade, in attempting to spawn several species of fish, and gave reasons for his successes and failures.

Altogether it proved a very interesting task for everyone.

After the interval an auction was held to dispose of member's surplus fish.

Table Show results: A.O.S. Tropical; I. T. Kirby. Danios; I. M. K. Kirby.

The secretary, Ron Travers, The Bungalow, Ashley-Arnewood, New Milton, Hants, BH25 5QA, will be pleased to welcome new members to meetings, which are held on the third Monday evening of every month at 7.45 p.m.

AT the February a.g.m. of the **Guldford and District A.S.**; their president (H. J. Dick) Aylett volunteered to maintain club stocks of live food, from grindall to wingless fruit fly. They are organising a members' table show on 11th April, specifically to get new members started. Special guppy class, 8 p.m., Merrow Village Hall, Guildford. Details: Charles Smith (Godalming 29792).

THE officers elected at a recent meeting of the **Mount Pleasant A.S.**, Gateshead are: chairman, B. Turrell; treasurer, B. B. Bloomfield; show secretary, R. Kirkup; hon. secretary, G. Thompson, 522 Coach Road Est., Washington, Tyne and Wear (Tel: Wash. 461437). The MPAS meet alternate Thursdays at the Mount Pleasant Social Club, Gateshead. New members welcome.

AT the a.g.m. of the **Leamington and District A.S.** the new committee elected was: chairman, R. Fife; treasurer, P. Thomas; show secretary, M. Burridge; asst. show secretary, K. Russell; social secretary, Mrs. I. Stoodley; librarian, Miss C. Stoodley; lay member, N. Ashfield; secretary, A. Maxfield, 23 Dunblane Drive, Leamington Spa, Warwickshire CV32 7TJ. Meetings are held on the first and third Tuesdays of each month, at 7.45 p.m., Trinity Hall, Trinity Street, Leamington Spa. New members welcome.

AT the February meeting of the **Bournemouth A.S.** members were entertained by a slide-tape lecture on "Furnished Aquariums" prepared by the Federation of British Aquatic Societies. This proved very enlightening, giving step by step instructions on setting-up and planting a home aquarium.

This was followed by the presentation of the society's annual trophies won in competition during 1978. Those interested in the fish-keeping hobby are welcome to their meetings, held on the first Monday of each month at Pelhams Community Centre, Millhams Road, Kinson, 8.00 p.m.

SECRETARY CHANGES

Northwich and District A.S.: A. Hamlett, 126 Elmwood Road, Barnton, Northwich, Cheshire (Tel: Northwich 76872).
Priory A.S.: C. A. Hutton, 6 Horsesham Grove, Meadowall Estate, North Shields (Tel: North Shields 76860).

CALENDAR

1st April: Reading and District A.S. Open Show at St Peter's School, Church Road, Barley, Nr. Reading. Ample car parking; 5 mins from M4. Schedules from P. C. Rushbrooke, 34 Melrose Gardens, Arborfield Cross, Berks. (Tel: A/C 760303).

1st April: Midland Aquarist League open show and inter-society show, Bureleigh Community College, Thorpe Hill, Loughborough. Close of Junction 23M1. Benching 12.00-2.00 p.m. Schedules: F. Underwood, 10 Hyde Road, Kenilworth (Tel: 592880).

1st April: Nelson A.S. annual open show at the Civic Centre, Stanley Street, Nelson.

1st April: Midland Aquarist League show at Bureleigh Community College, Thorpe Hill, Loughborough. As well as the M.A.L. classes, there are a number of open classes. Schedules from Show Secretary, I. S. Purdy, 10 Cleveland Road, Loughborough, Leics. LE11 2SP.

7th April: Catfish Association of Great Britain Open Show, Raynes Park Methodist Hall, Weybridge Road, Raynes Park SW 20. Schedules from Show Secretary, Mr. T. Cruickshank, 82, Stanley Avenue, Greenford, Middlesex, phone 01 578 0104.

8th April: Malvern & District A.S. open show at St. Joseph's Hall, Newton Road, Malvern. Schedules from J. V. Walton, 1 Beaver Close, Lower Wick, Worcester WR2 4EG (tel: 422002).

8th April: Kettering A.S. open show at McKinley Theatre. Schedules available from D. McAllister, 105a Welland Vale Road, Corby, Northants.

8th April: Halifax A.S. open show at Forest Cottage Community Centre, Cousin Lane, Illingsworth, Halifax. Schedules: s.a.s. to David Shields, Cobblestones, Gaised, King Cross, Halifax, or telephone Hx 60116 after 8 p.m. for details.

8th April: Morley A.S. open show at Newlands School, Wide Lane, Morley, Nr. Leeds. For further details ring Wakefield 62144.

11th April: Aveborough and District A.S. open mini show and auction, at Greenacre Hall, Rawden, at 7 p.m.

14th & 15th April: Aberdeen A.S. open show in The Music Hall, Union Street, Aberdeen.

15th April: Stockton-on-Tees A.S. 14th open show at Kiora Community Centre, Roseworth Estate, Stockton. Schedules from Mr. D. Krubba, 15 Gray Street, Norton, Stockton, Cleveland.

15th April: Hyde A.S. open show at the Hattersley Community Centre, Hattersley Road East, Hattersley, Benching 12.00-2.00 p.m. The show will be run on F.N.A.S. rules and regulations and the F.N.A.S. show league will be in operation. Schedules from show secretary, K. J. Sherwin, 14 Lime Grove, Denton, Manchester, Lancs. s.a.s. please.

16th April: Marlow and District A.S. Dr. Ford of Aquarist.

16th April (Easter Monday): Southampton A.S. Open Show at The Avenue Hall, The Avenue, Southampton. Schedules from Don Mills 30, Ferndene Way, Bitterne Park, Southampton.

22nd April: York and District A.S. Open Show at the Livestock Centre, Murton, York. Benching 12 noon to 2 p.m. Details from Show Secretary Mrs H. Welsh, 1 Enfield Crescent, Holgate Road, York.

22nd April: The Hertfordshire Area Group of the British Cichlid Association are holding a convention at the Ilstree/Borehamwood and District Community Centre, Alum Lane, Ilstree, Herts., at 2.30 p.m. The speaker will be Mr. Brian Chandler, of Thringstone Aquatics, who will be talking on African cichlids. Admission free.

22nd April: Leigh A.S. annual open show at Leigh C. of E. High School, Leigh Road, Leigh. Schedules from B. Lawless, 9 Spruce Close, Lowton, nr. Warrington.

28th April: Southend, Leigh and District A.S. open show at St Clements Hall, Leigh-on-Sea, Essex. Details from Open Show Secretary, Ray Stanford, 1 Hilary Close, Rochford, Essex. (Tel: Southend (0702) 54690).

28th April: Bristol Tropical Fish Club annual open show of tropical fish, will be held at the United Reformed Church, Whitefield Memorial Hall, Muller Road, Horfield, Bristol, to F.B.A.S. rules. A Trophy class has been applied for. Show Secretary, Mr. T. A. Coggins, 36 Leighton Road, Southville, Bristol BS3 1NT (tel: 631307) from whom copies of schedule will be available on request and accompanied by s.a.s. Postal entries will be accepted up to Thursday, 26th April.

29th April: Half Moon A.S. open show, Corporation Hall, West Row, Stockton, Cleveland. Schedules from C. W. Buck, 22 Danby Grove, Thornaby, Cleveland, TS17 8BX. Tel: Stockton 65284.

29th April: Corby A.D.A.S. Open Show, Corby Civic Centre, F.B.A.S. rules. Schedules from C. MacAllister, 18 Maidford Road, Corby, early March.

29th April: Havant & District A.S. open show at the Horsdean Community Centre, Merchiston Hall, Portsmouth Road, Horsdean. Schedules from the show secretary, Mr. H. Armitage, 74 Park House, Farm Way, Leigh Park Havant (Tel: Havant 473192).

6th May: Yeovil & District A.S. open show at the Martock Village Hall.

6th May: Midlands Aquatic Study Group open show at Conington Hall, Chadmoor, Cannock, Staffs. 37 classes with over 100 trophies to be won. Schedules available (s.a.s. please) from I. Fuller, 38 Cambrian Lane, Rugeley, Staffs, WS15 2XH.

6th May: Hull A.S. open show.

6th May: Osram A.S. open show. Details from Show Secretary, P. Hewitt, 5 Staveley Close, Shaw, Oldham OL2 8ND (Tel: Shaw 44908).

6th May: Forfar and District A.S. third open show at the Reid Hall, Forfar. Official Federation judges.

6th May: Bournemouth A.S. open show at Pelhams Community Centre, Kinson.

12th May: Tonbridge and District A.S. fish exhibition at Lambeth Walk, High Street, Tonbridge.

12th May: Port Talbot A.S. open show at the Talbach County Youth Centre, Margam Road, Port Talbot, West Glam. Trophies, plaques, cards for all classes. Schedules early March from Show Secretary, A. E. B. Touracre, 3 Cross Street, Velindre, Port Talbot, West Glam. SA13 1AZ. (Tel: 3752).

13th May: Goolle and District A.S. open show at the Shire Hall, Howden, Nr. Goolle.

13th May: British Koi Keepers Society national a.g.m. at the Botanical Gardens, Eghaston, Birmingham, at 1 p.m. Membership details apply Mr. M. Wamsley, 165 Woodside Road, Armersham, Bucks, HP6 6NR.

19th May: Trowbridge & District A.S. Open Show at St. Thomas Church, Timbrell Street, Trowbridge, Wilts. Schedules will be available from Mr. J. Bennett, Show Secretary, 20 Lewis Crescent, Frome, Somerset.

19th May: Caer Urfu A.S. first open show in the Chuter Ede Community Centre, Denton Road, South Shields.

20th May: Caer Urfu A.S. 1st annual open show at the Chuter Ede Community Centre, Denton Road, Biddick Hall Estate, South Shields. Fish auction and entertainments. Schedules later from the Show Secretary.

20th May: Gloucester Aquarist Society Open Show to be held at Chequer Bridge Centre, Painswick Road, Gloucester. 31 classes to F.B.A.S. ruling. Trophies for 1st and 2nd plus award cards. Dr D. M. Ford of 'Aquarist' will give a slide talk on Aquaria around the World during judging. Schedules from March, from Mr. S. Grainger, 2/10 Bazeley Road, Mason, Gloucester.

26th May: The British Aquarist's Study Society, Second Spring Meeting at 2 p.m. at the Meeting Rooms of the Zoological Society of London, Regents Park, N.W.1. The Barbs—Dr. Keith Banister of the British Museum Natural History and other speakers. Tickets, £125 members and £150 non-members, from W. E. Goodwin, 14 Dawlish Drive, Driven Park, Bedford.

27th May: Merseyside A.S. annual open table show at the Rainhill Village Hall, Rainhill, Lancs.

27th May: Portsmouth A.S. inter-club show at Portsmouth Community Centre, Malins Road, Portsmouth.

27th May: Bridlington & District A.S. open show at the Hilderthorpe Junior School, Shaftesbury Road, Bridlington. Details from Mr. M. Jordan, Show Sec., 12 Greenfield Road, Bridlington.

27th May: Merseyside A.S. annual open table show, Rainhill Village Hall, Rainhill, Lancs.

3rd June: Scunthorpe Museum Society Aquarist Group 9th open show at Charter Hall, Corporation Road, Scunthorpe. Schedules available from Mr. D. Caldwell, 5 St. Martins Road, Scarsby, Brigg, South Humberside DN20 9BG.

3rd June: Redcar A.S. open show at Gotham Bowl, Redcar.

3rd June: Loughborough & District A.S. open show at Bureleigh Community College, Thorpe Hill, Loughborough. Schedules from I. S. Purdy, show secretary, 10 Cleveland Road, Loughborough, Leics. LE11 2SP.

3rd June: Mid-Sussex A.S. invitation inter-club show at Sydney West Hall, Leylands Road, Burgess Hill. Further details from T. Tester, 19 Cyprus Road, Burgess Hill, West Sussex RH15 8AX (Tel: 43202).



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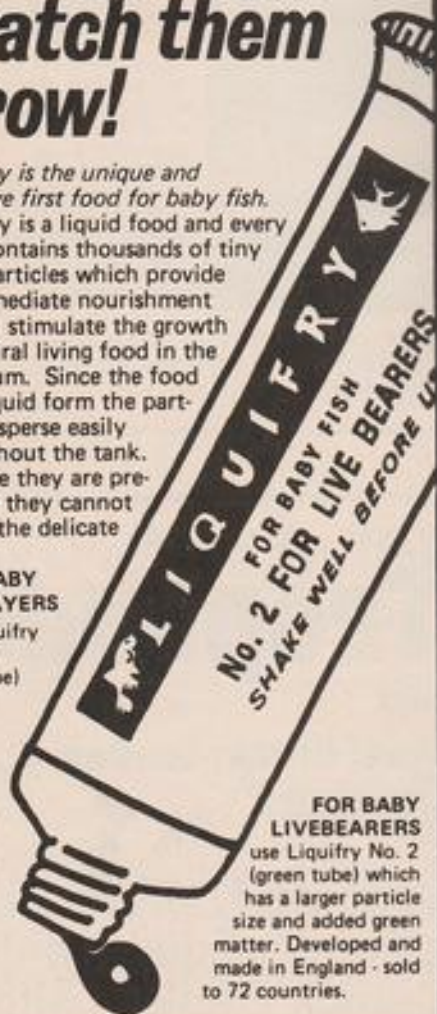
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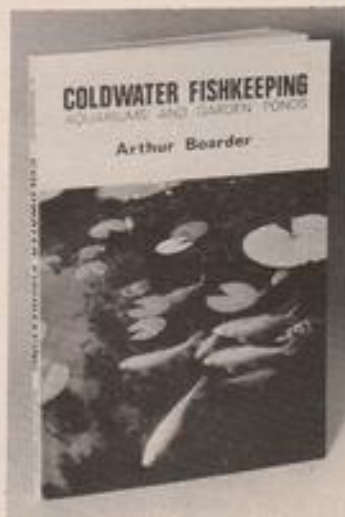
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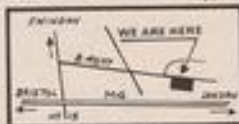
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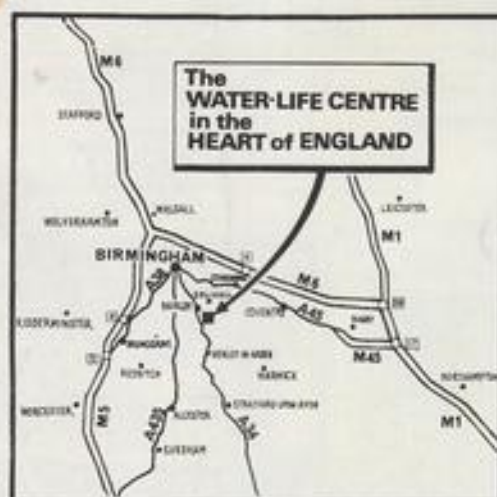
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