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For wholesale plant list, TRADE headed paper please.
Please address all correspondence as address above.

December, 1966
Mr. Rous extends to his customers past and present every good wish for Christmas and the New Year.

Owing to the many requests of our customers we have now opened a department for the sale of aquariums and accessories at our Staines establishment.

Opening times:- Mondays, Thursdays, Sundays, 10 a.m. to 4 p.m.
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We are also importing weekly several thousands of tropical fish for distribution to Staines and other branches.

BOOKS FOR CHRISTMAS

- Tropical Fish in the Aquarium: £18.00
- Illustrated Dictionary of Tropical Fish: £10.00
- Aquarium Plants: £3.60
- Exotic Tropical Fishes: £15.00
- Exotic Aquarium Fishes: £37.50
- Freshwater Fishes of the World: £21.50
- W.T. Iones: £61.00
- All About Tropical Fish: £7.50
- Tropical Fish: £14.00
- Encyclopaedia of Tropical Fishes: £15.00
- Goldfish: £6.00
Hobbyist and trader relations
by John Thorne,
Chairman Hounslow and District A. S.

THERE appears to be, within our hobby at the moment, a great deal of bad feeling amongst clubs and their members that they are getting a raw deal from the (mainly) larger retailers who used to entertain club visits. Numerous reports and letters have been published in various magazines and newsletters this year alone complaining of this. I have done a fair amount of research into this problem and found that there are several 'fors' and 'agains' on both sides.

For the trade side against such visits I learned of two who had had fish stolen; in one case an Arowana and the other a really large Aerostomus Aerostomus. Neither one a cheap loss. The former trader also lost a lot of large Amazon Swords as well. A third, who has a beautifully laid out country house and grounds, had club parties picnicking on his lawns. This he didn't take exception to, but he did to the amount of litter that was often left behind. The last straw was when people started picking flowers and, to get at the blooms they wanted, broke down shrubbery, etc. Several more complained that all too often clubs treated their visits like a trip to the Zoo, just looking and not buying at all. With staff problems and the wage scales that at present prevail, this makes such visits wholly uneconomic and time-wasting.

Now for the club and enthusiast side. Many are dismayed on visiting nationally and locally well known hatcheries, etc., at the shockingly poor selection usually available and indeed, at the condition of some of the specimens offered for sale. A point I particularly take exception to is the filthy conditions that some of our pets are forced to endure. This in itself puns the majority of people off at once. Another great point I know amongst the keen show enthusiasts in the hobby is that they like to select their...
BAF 1966
by A. Boarder

I HAVE been reporting these exhibitions since 1958 and each year I have had to report an increase in entries and interest. It is therefore difficult for me to find words adequate enough to describe this year's show. If I had to write blurbs for a new film I could use such adjectives as stupendous, terrific and colossal, but I am rather at a loss for words to describe the marvellous effort made by the supporting and exhibiting clubs. Unless anyone was fortunate enough to attend this show he can have little idea as to the attractive displays of stands and the enormous number of visitors to the show.

The hall was 100 yards long and 23 yards wide and on the Sunday it was so packed with visitors that when looking from a raised place at one end of the hall there appeared just a sea of heads. I understand that 9,000 visitors saw the show. There were 31 stands put up by exhibiting clubs and societies and the ingenuity of many of them deserved considerable praise. This type of show is so attractive, not only to aquarists but to the general public. After all, at the usual aquarists show there are rows of tanks, all looking rather alike and often with a small fish in an
otherwise empty tank, hiding behind the front tank iron.

Whether the visitors were aquarists, their friends or the ordinary public, I am certain that they found much to interest them. Most of the stands were very neat and attractive but a few were especially good with schemes which showed what a lot of thought had been put into the efforts. The outstanding exhibit of the Isle of Wight A.S. was a model of a hovercraft, about 24 feet long and, I believe, a half-size model. Their display tanks were arranged round the curtain and I must congratulate this society on coming so far and making such a grand display. The stand was awarded first prize and the second by Gorton and Openshaw A.S. was a sailing boat, full size, with tanks set in the imitation sea surrounding the boat. The third prize went to Blackpool, with a lighthouse which had even a revolving light at the top. This was worked by an electric motor which gave three revolutions a minute. Another very good stand was that of the Crewe and District A.S., who displayed a pit shaft with the wheels etc., and their tanks inset round the walls of the building. Although this club has only been formed for a year, the members are so keen that, far from being disappointed at not getting a prize, they state that they will be at the show next year and they intend to win.

Another good stand was a water-mill complete with a five-foot wheel working by water. Another novel entry was representing the World Cup, with flags of the competing nations displayed. One stand which was missing this year was that of the Guppy Association. The many enquiries at the Aquarist stand for this display showed how much interest had been lost by the decision not to exhibit by the Continued overleaf

Left: Gorton and Openshaw's sailing boat gained second prize

Osteoglossum bicirrhosum—this fine specimen of a strange fish attracted much attention
Society and many visitors hope that next year they will see their usual attractive effort reintroduced.

There were plenty of very good fishes for the aquarists to inspect but I feel that the entry which stole the thunder was a beautiful marine tank exhibited by the Marine Study Society. I have never seen a lovelier tank in my life and was entranced by the wonderfully coloured exotic tropicals, especially a couple of clown fish rubbing themselves continuously in and out of a fine large sea anemone.

The fine pair of Tinfoil Barbs attracted much attention but one of my favourites was a fine specimen of an Arowana, Osteoglossum bicirrhosum. Not only was this fish very attractive but as soon as anyone looked at it a splendid performance was enacted. The fish swam from end to end of the tank in mid-depths, showing off like a film star.

The dealers' stands were more numerous than I have seen before and by the look of the six-deep ranks of prospective buyers surrounding them most of the time, I hope that their attendance at the show was as rewarding as possible.

I understand that the entries were 30 per cent. up on last year and that several new clubs were exhibiting. I can foresee that next year the length of the hall will have to be increased to accommodate all the entries.

* Full results of the festival on page 203
The above picture shows the realistic approach that has been taken in setting up this aquarium

Noah’s Ark Aquarium, Weymouth

The Ark itself is in the shallow lake which forms part of Weymouth’s backwater, and is actually built on a concrete base. A thousand tons of rock and sand, with the hull built around to appear as if afloat. The actual building is 75 feet long and 35 feet wide, with the inside divided down the middle by a long planter filled with tropical flowers. There are eight four-foot tanks down either side at adult shoulder height, and two four foot tanks at children’s level at the bottom end, over which is a beautiful mural of Noah sending forth the Dove—a masterpiece in brilliant colouring 15 feet wide which was specially commissioned for the Ark.

The collection displays a large variety of fish, one tank devoted entirely to tetras, another to gouramis, guppies, angelfish, large tandalls, blue acaras, discus (i.e., a tank for each of these). One amusing set-up is a tank full of bumblebee fish with a couple of china beehive aerators made especially for the purpose by a local potter, and which, duly labelled “Mrs. Noah’s Bees” causes great amusement and interest. The children’s tanks are community ones and also have divers, crocodile and mussel diffusers in them which the little ones love to see. (There is also a specially built rail around the higher tanks so that the children can see into the adult tanks as well as their own.) Wired-in music plays soft Hawaiian tunes in the background.

Open from daylight till dusk in the summer and ten to six daily, including Sundays, during the winter, with early closing Wednesdays. Fish, plants and all equipment are available on the premises.

The Noah’s Ark was only built this year, and was opened to the public on the 26th May. Over 50,000 people had visited it by the 26th August, and many more since then.

Prices of admission are: Adults 2s.; children over 5 years and Pensioners 1s.
Our experts' answers to tropical fish-keeping

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of the fancy being covered. Any query and answer can be published; and a stamped self-addressed envelope should be sent so that a direct reply can be given.

The fish in my pond are suffering from fungus. How does this get into a pond and is there any hope of saving the fish?

The spores of the fungus Cladosporium are present in most waters. Any healthy fish is not likely to be attacked unless it receives some damage to its skin. All healthy goldfish have a protective mucous covering which repels most parasites and germs. If a fish is in bad condition this mucous becomes deranged and the fish is then prey to any attack by foes or germs. By your description of the pond I consider that it is very overcrowded with fishes. This would mean that they are not in a healthy condition and so would soon succumb to any growth of the fungus. The salt treatment should cure a fish unless it is too far gone, which is when the fungus reaches the gills. See that conditions are correct in the pond and that too many fishes are not kept.

Recently I bought a pretty plant called Australian four-leaved clover. It has made no progress since I planted it in my tank, and I wonder whether you could give me any hints as to its successful cultivation in the tropical aquarium?

There are several species of the genus Marsilea indigenous to Australia. M. brenan is the species most suited to growing in the tropical aquarium. This plant does best in a shallow pot of gritty clay or loam placed where it will receive at least ten hours of bright light. The trouble with this plant, however, is that it tends to push its stems and hairy foliage well above the surface of the water.

I have just installed a 3 ft. tank in a dark corner of my lounge. The reflector hood has sockets for three lamps. Please tell me the total wattage required to keep the plants healthy? I intend to keep the lamps switched on for at least ten hours each day.

120 watts (three 40 watt clear or pearl lamps) is advised. Most plants should prosper under this intensity of light in clear water not more than 15 in. deep.

Is it true that a good bunch of Elodea densa introduced into a tank of green water will render it quite clear before many days are over?

Elodea densa is a fast-spreading and greedy feeder which, in too great a quantity, will rob free-swimming algae of much food and light. About a dozen longish stems of this plant weighted to the bottom of a newly-settled tank not longer than 24 in. by 12 in. by 12 in. will almost always lead to a diminution of free-swimming algae before a fortnight is out.

At what age can a male guppy fertilise a female guppy?

Some young males reach sexual maturity sooner than others, but in general we would say that a male guppy is capable of fertilising a breed at the age of five to six weeks.

Recently I came across an interesting reference in an American magazine to a fish called the Congo cichlid. Please tell me whether this fish is available in this country and is it suitable for a community tank?

The Congo, or kongo, cichlid is just another popular name for the black-headed or zebra cichlid formally known as Cichlasoma nigrofasciatum. This fish is attractive in appearance and easy to keep, but is a great scraper and destroyer of plant life. Because it is easy to breed and does not grow inordinately large it comes on the market quite frequently.

A crack has appeared across the corner of my framed aquarium well below the water line. What steps should I take to prevent the water escaping out?

Provided the cracked glass is still held securely in the frame you should be able to make a permanent repair by painting over the crack with two or three coats of clear varnish. If moisture is coming through, stop it away with an absorbent cloth and apply surgical tape along its length. Then before this tape has time to absorb moisture, paint over its surface with a quick-drying enamel or paint.

I have just acquired a fine pair of Rivulus hartii. Is this tooth-carp easy to breed?

A pair of Rivulus hartii will breed freely if you give them a tank to themselves and feed them generously on such things as great larvae, whites worms, and the like. The large adhesive eggs are deposited in the plant life—dense planting is called for—every so often and the fry, as they hatch out, keep clear of the parent fish. The fry, which are about the size of newly-born guppies, can be given micro-worms and tiny Daphnia as soon as they hatch out.

I am thinking of starting a small tank containing three or four minnows. What size tank should I have and can you tell me where to find a stream containing minnows?

You should have a tank not less than 24 in. by 12 in. by 12 in. Minnows like very fresh water. I do not know what streams are in your district but you will have to find one with fairly fast running water and a gravelly bottom. Minnow traps are sold by some angler suppliers and if baited with bread are very effective at catching these fish.

THE AQUARIST
Coldwater fish-keeping answered by A. Boarder

Can I breed bitterling carp with goldfish in my pond?

Bitterling carp have a peculiar method of breeding and I do not think that you would be successful at getting them to breed in your goldfish pond. The bitterling carp lay their eggs in a mussel where they hatch out. Claims have been made that these mussels live harmlessly in your pond there would be no chance of them breeding. Even if the mussels do remain healthy in a well established pond with plenty of mud or muck at the bottom. Otherwise they could not move around and feed.

A two year old roach was found dead in my pond. I thought it was suffering from egg composition. On opening it up I found the seminal specimen. I would be grateful for your opinion as to what they are.

The specimen sent were tape worms. These could live in a fish for some time and grow to a great length. They live on digested food in the intestines of a fish and lay many eggs which are passed by the fish in its excrement. Most forms of tape worm go through a cycle of development and in one form the small parasites are eaten by a bird after eating an infested fish. A further metempsychosis takes place and eggs are laid in or near water; fishes then ingest them and the tape worm develops inside a fish which has eaten the eggs. This emphasizes the danger of introducing wild fishes into a goldfish pond without due care and quarantine.

I would like to keep a small pair of sticklebacks in a tank. How do I feed them?

These fishes live on many forms of live foods and can be kept by giving plenty of space and feeding on chopped small garden worms, white worms, tubifex, blood worms, meal worms and broken maggots. They may take some forms of dried foods but do better with live foods.

When is the best time to clean out my pond?

At the end of the autumn when all the leaves have fallen and vegetation died down.

I have a pond with fish, water lilies and snails. I was interested in getting the young snails to maturity and the question is, do you have a gardening magazine for information on this and was given the following answer and would be glad for comments please. The reply given was, "I assume that you refer to the ordinary pond snails rather than the elusive “Water-snails”. Pond snails lay their eggs in the way you describe and breed quite freely. I don’t know whether the fish would eat the young snails but had you had the true water-snails these would eat fish.

The reply received from the gardening magazine is interesting, as far as five snails could have enough of these snails on all subjects. Of course pond snails will eat water snails and I have yet to see a water snail attacking a fish in an endeavour to cut it. Most coldwater fishes will eat very young snails, that is, soon after they have hatched. Trench and some other fishes will eat fully grown snails, as even if they cannot crush the shells they eat the snails out and consume them. If you want to use more water snails I suggest that you take some leaves with snails on from the pond and hatch them out in ash. You can feed the young snails on soft vegetation, crushed lettuce leaves will do. The types you have are the large pond snail (Lymnaea stagnalis) and the Ramshorn (Planorba cornea).

I queried a description of how to set up a tank for goldfish which was given by the BBC, in which they said that the water should be changed every two days for the fish to remain healthy. In reply to my query as to why a book on such a subject had not been consulted I was told that there was no need for this as they had been advised by a Fellow of the Zoological Society. What is your opinion of this please?

The qualification of the consultant does not mean that he was an expert on setting up an aquarium. A properly set up and run tank can last for many years without ever having the whole of the water changed. Just a weekly servicing to remove some of the mud is sufficient. At such times a small proportion of the water is removed and replaced with fresh.

I have a female goldfish which I think is going to spawn. Can you tell me how long it takes for her to spawn?

A female fish will normally spawn unless a male fish is in attendance. The eggs (hard red) can remain in a fish for a long time and they will not be expelled until a male fish encourages the female to lay. This is done by the male chasing the female through water plants and nudging her about the body. If a female did drop her eggs without a male fish being with her at the time the eggs would be infertile. It is strange why goldfish should spawn at a particular time or day as they can be together in a good environment for weeks without any signs of starting to spawn. Something triggers off their actions but it is open to question as to what it is. It certainly seems that goldfish are not likely to spawn unless the water has a good oxygen content.

Please can you advise me of any way to cure a fish of fungus disease other than using salt?

There are substances advertised in The Aquarist, for the cure of fungus which you can try. I have always found that the salt treatment is effective. Sea salt, Tidman’s will do, is better to use than table salt and a tablespoon to a gallon of water is usually enough, but if the disease persists after four or five days some more salt can be added, even up to another tablespoonful. When treating a fish see that the water keeps free from smell and do not use a deep container. It is sufficient if the water just covers the extended dorsal fin.

My concrete pond has developed a leak which is not very big but the pond loses about seven inches in a week. I would like to know if you can fill the pond in one day, after a leak has been caught. What could I use, and would Synglas be all right for the job?

Synglas is very good for stopping leaks in a greenhouse roof but I do not think it would be suitable for repairing a crack under water. I find the best substance to use is Prompt cement. It appears that this is difficult to buy in some areas and so if any quick-drying cement can be
continuing cold-water queries

obtained it should be all right. The Prompt cement sets in about half an hour and I have found that a repair with this can be washed after an hour and the pond refilled. The small amount of free lime is not likely to harm the occupants of the pond. I find that a small patch of lime-film comes to the surface after a day or so and this can be carefully scooped up with a small scoop. The cement can be mixed with equal parts lime, sharp sand. Only dump a little at a time as it is used as it sets so quickly once dampened. Any loose concrete must be removed from the crack and the surface to be repaired must be clean and wetted slightly.

Your advice was to use sea salt instead of table salt. I have sent away for some but am doubtful if I can get any. Would sea water be as good as I live near the sea; if so what proportion should I use with fresh water?

There is no need to experiment with sea water. Buy a tin of Titman sea salt from any chemist, this is all you require. Books used to sell a good cheap kind called Shores' sea salt, but I have not been able to get this for some time.

What is a good disinfectant for a tank containing fishes and plants also for an empty one?

If you use too strong a disinfectant in the occupied tank you could harm the fishes. A solution of permanganate of potassium is one of the safest to use. Make it the colour of beetroot and it should not harm the fishes or the plants. For an empty tank it is possible to use stronger types and a tablespoonful of household ammonia should be sufficient to kill any pests or disease in a 24 x 12 x 12 in tank.

I have been given a culture of small wingless flies and have been told that they are excellent food for goldfish. What method would I use to breed them?

Compost as advertised in "The Aquarist," for breeding Grindal worms etc., should be all right for the job. However, why not breed white worms (Entobius) instead, as they would be less trouble and a very good food for all types of small fishes.

I have recently obtained a pond with goldfish and have become interested in keeping fishes. I have a book or two on the subject but cannot find any reference anywhere as to how long a fish can be kept out of water when giving it any treatment.

Fishes similar to goldfish can be kept out of water for a considerable time, at least as long as is necessary to give treatment. The main point to watch is that the fish is never allowed to get dry, especially the gills. I have known fish of the carp family live for a day or so when wrapped in wet grass or moss. When handling a fish do so with wet hands and try to avoid holding it too tightly or removing any of the mucus covering.

If it is necessary to kill a sick fish, what is the best way to do it?

Drench the fish smartly on a hard surface, such as a concrete path. Death is instantaneous and I know of no better or quicker way of dealing with the problem.

It is stated that copper is poisonous to fishes but what can I do as all my house water comes through copper pipes? Is there anything I can add to the water to counteract the ill-effects of the copper?

This is a difficult problem. I know of nothing which added to the water would nullify the effect of the copper. I think that if the water pipes are not very new it might not be so deadly. If you have no other source of supply then I suggest that you allow the water to run to waste for a time and then use the following for the pond. It is usually when the water has been in contact with the copper pipes for some time that the trouble would be worse. Also, if water is run continually into a pond through copper pipes this is very bad. If you fill the pond with water as suggested you could try some water plants and Daphnia to see if they survive before adding any fishes. A few water snails would also be a good test as these soon die if the water is dangerous. The trouble might be to find the snails once they died.

I have moved to a house where there is a garden pond with plants and goldfish. The previous owner told me that he never cleaned any of the plants nor put in any other fish or device. Is this all right or should I feed them sometimes?

If the pond is well planted it is probable that the fishes will be quite safe if left unfeed. It depends on the number of fishes there are in relation to the amount of water. You can always test whether the fishes are hungry by throwing a piece of dry, brown bread on the surface. If they are hungry they will soon be up after it and then some suitable fish food can be given.

I am thinking of adding a couple of catfish to my pond as scavengers. Will the existing fish in the pond turn on them and attack them?

There is no likelihood of this happening as the occupants are goldfish. But the catfish will be on the lower food as catfish can attack and eat any fish small enough to get in their huge mouths. If you want catfish to grow large enough to eat all the other fishes in the pond by all means add them, but any well-kept pond can function very well without catfish, as ordinary goldfish are just as good scavengers providing they are not overfed.

I have a fastid in my pool which has developed white patches on the body and it is losing some scales. What is the cause and cure?

It is probably suffering from Costiasis, a parasitic disease. Place the fish in a shallow container such as a plastic washing-up bowl. Add sea salt to the strength of a teaspoonful to a gallon of water. Do not have too much water in the bowl, just enough to cover the dorsal fin when extended. Leave in this solution until cured and change the water if it gets foul to a similar solution strength. Do not feed until the fish appears to be improving and then give live food only for a time.

I think my fishes in the pond have fish lice on them. I want to change them to another pond and would like to know what to bath them in before doing so?

A Dentol solution should be all right. Not more than a quarter teaspoonful to a gallon of water is enough but never leave the fishes in this solution unattended, as if a fish turns over, it must be removed immediately. In any case do not leave fishes in this for more than five minutes. Fishes usually recover quickly when returned to fresh water. A too strong solution of Dentol could be dangerous as it is a powerful disinfectant.
Anchor worm—a menace to the garden pond
by Astitbes

The above pest is not a worm but a crustacean and goes through a metamorphosis as do many other crustaceans. Until recently it was thought that this parasite did not occur in Britain, but it is quite certain that specimens of it have been found attacking goldfish in garden ponds. It is probable that the pests were introduced into this country with goldfish imported from America. In the early stages of development it is possible for the larvae of the crustacean to be embedded in the skin of a fish and it would not then be noticed. The later development of the 'worm' would not occur for some time afterwards, weeks perhaps.

I must admit that I have never come across this pest in all my experience of fishkeeping. It may be that I have had no goldfish in my pond since 1937, when I first started my strain of fantail goldfish. My only knowledge of this parasite was what I had gained from books, and the shape of the 'Anchor worm' was quite familiar to me from illustrations.

Over several months I have had letters from readers with questions as to what the particular pest was which was attacking their fishes. One sent me some dried up specimens which looked like Lernaea to me. I then had other letters about the pest and one or two very good sketches of the creature which indicated to me without much doubt that the creatures were actually Lernaea. I answered one of the queries in 'The Aquarist,' some months ago and had a letter from a scientist of the Freshwater Biological Association on the matter and he questioned as to whether my diagnosis was correct as this parasite had not previously been reported in Britain.

However, he has been most helpful in trying to solve the problem and with the assistance of some of the pondkeepers who reported the pests to me it has been possible to establish quite definitely that the parasites are Lernaea. Some of the Lernaea have been sent to him and have been recognised as the creatures in question.

It appears that the 'worms' found on the fishes are all females which attach to the fish by means of 'arms' which grow from the head. The male is tiny and resembles a Copepod. The females produce two eggs from which the larvae emerge. These are called 'siphons' which settle on a fish and turn into the Lernaea as described. Some species of Lernaea have larvae which can infect the gills of fishes and cause great damage.

It appears that the Lernaea can only be pulled from the fish with tweezers when it is probable that a bad wound will be left. Whether the fish could be treated when the first signs of the trouble are found will be open to experiment. I wonder if it would be possible to pick the spot where one of the larvae is developing on a fish and smooch with a strong disinfectant. The 'worm' is apparently quite tough as it does not break when it is pulled away with tweezers. It has been stated that the parasite will leave a fish if it is touched with paraffin, but if it is well attached to the fish I am rather doubtful as to the efficiency of this method of ridding the fish of the pests.

The letters I have received from readers describe the pest as being about half an inch long, like a thread emerging from the fish. The following is a description I have received:—'The creature which is about half an inch long adheres to the side of a fish and is semi-transparent and seems to have transparent suckers from the head. I have removed two with tweezers and they have left open wounds. The fish were introduced to the pond two months ago and appeared quite healthy.'

Another letter said: 'A couple of months ago we stocked our pond with goldfish. All went well for a time but about six weeks later we noticed that five fish had a red spot, all on their backs, at the end of the dorsal fin. A day or so afterwards these spots developed a white 'head,' rather like a boil would appear on us. A little later still each place had a thin root or thread (white in colour), growing out of it. The fish were still lively and eating well. Salt baths were tried with no effect. Then the parasites were pulled out with tweezers when a large core came away with each one leaving a nasty hole with some bleeding.'

The infested fishes were then given a salt bath and a later letter from the same reader informed me that the fishes appeared to be quite well again with no further outbreaks of the pests. It seems that if a bad infestation by these parasites was present in a garden pond it would be difficult to clear the pond again; the larvae might still be present in the water and being so small would not be seen. It certainly appears that the Lernaea have come on fishes introduced into this country and it is fairly sure that most goldfish on sale today have been imported from abroad. If such fishes had some of the Lernaea larvae on them when brought in they would be in such a stage of development that they could go unnoticed for some time. From some of the letters I have received on the subject it seems that about six weeks can pass before the actual worm-like Lernaea protrudes from a fish.

As this parasite may become quite prevalent among imported goldfish it is essential that all pondkeepers watch for the pest and with the co-operation of all it may be possible to provide a good deterrent which will help anyone who may get an attack on their goldfish by these parasites.

Stop press—OBITUARY.

It is with deep regret that we announce the death of Mr. W. C. Phillips. Further details will be published in our next issue.

December, 1966
Breeding slow-worms in confinement

By H. G. B. Gilpin

In an attempt to breed these interesting and attractive creatures under indoor conditions, a male and two females were kept together for several months. I obtained the male about a year and a half ago and the first of the two females in the early spring of this year. The second female was introduced in June. All three were fully adult, in fine condition and averaged around fourteen inches in length.

They were placed in a standard, commercial type metal sided vivarium with a sloping, sliding glass top. Holes covered with perforated zinc in the sides provided ventilation. Its overall dimensions were twenty-four by fourteen inches, rising from three and a half inches in front to seven inches at the back. A loose hard-board shield, six inches wide, was laid on the glass to ensure that at least a part of the vivarium was permanently shaded. The position of this shield could be varied so that by moving it from time to time the vegetation could receive an adequate amount of light.

The vivarium was placed in front of a West facing window. Its floor was covered with coarse sand over which was laid an inch of soil. A few relatively large stones were scattered here and there, their rough edges being of assistance to the animals at such times as they were changing their skins. Two flat stones placed together to form a "tent" supplied the slow-worms with a resting place. They used this freely and also buried themselves under the stones when in need of seclusion.

A few plants, including small cacti, succulents and a piece of turf were introduced. At first I was hesitant about the cacti in view of the sharp spines covering them. In actual practice these fears proved groundless. The slow-worms remained in excellent condition and avoided damaging their skins on the innumerable points. Water was provided in an earthenware pot, four inches in diameter and three quarters of an inch in depth. A few daphnia were put in the water to keep it clear, thus avoiding too frequent changes and disturbance of the slow-worms in the early stages.

The slow-worms were not difficult to feed. They were given small earthworms, gentle and slugs, the latter ranging in size from the smallest available to a maximum of not more than three quarters of an inch in length. Ants and woodlice were also offered but these disappeared slowly. The slow-worms rarely ate the gentle and many of them pupated and later emerged as blow flies, at which stage in their life history they had a greater appeal for the slow-worms. Slugs proved to be by far the most favoured item of diet. The slow-worms seized them readily and swallowed them with slow deliberation.

During the last week in August the female, which had been caught in June, died. A post mortem disclosed the presence of a fully developed young one. A few days later the remaining female produced ten babies, five of which were left with the parents and five transferred to a nursery cage, smaller than the breeding cage but similarly furnished. They were beautiful little creatures, black on the underparts.

Continued on page 197
Safety thermostat

by Joshua Allen

Most of us have the permanent nagging worry that one day we will look at a tank to find steam rising from the water and the fish dead unhappy or just dead.

The simple method described here will prevent this occurring. Anybody who has wired in his own thermostat can fix this within an hour by following the step-by-step instructions.

Operation

The diagram is almost self explanatory. An additional thermostat is inserted in "series" in the mains supply to the heater. This extra one is called the safety thermostat.

The safety thermostat is set at 5 (to 10) degrees above the normal temperature of the tank. It is therefore always closed. In other words it is doing its best to raise the temperature by 5 degrees, but it can’t because the original thermostat is opening before the water temperature rises above normal.

Fault condition

If a fault occurs and the original thermostat sticks in the closed position, par-boiled fish is usually the result. However, now the safety thermostat comes into operation at 5 degrees above normal and all is safe though a bit warm.

How to do it

1. Slit the outer covering of the heater cable (watch off and disconnect first!) and pull out the "live" (red, usually) wire and cut it.

2. Strip off the last half inch of insulation on the two new ends.

3. Take the safety thermostat and bare the ends of the two wires in a like manner.

4. Join in the safety thermostat leads, one to each of the two new ends pulled out of the heater cable. Insulate appropriately.

You should now have your safety thermostat wired into the heater cable looking just like your normal thermostat. By the way, it doesn’t matter if it is connected into the mains side of the normal thermostat or between it and the heater.

Setting up

Adjust the temperature of the safety thermostat according to maker’s instructions. Remember to take the normal one out of the water (so that it cools) whilst you are making this adjustment.

What type of thermostat?

As this is for emergency operation and we hope will never actually have to operate, I would suggest a cheap one. Old ones out of my junk box I found to be quite suitable for this limited task.

Refinement

A tiny neon indicator across the contacts of the safety thermostat will glow if the contacts open, indicating that the safety thermostat has come into operation and all is not well. A suitable neon encased in plastic, completely waterproof and requiring no mounting (it can be dangled on the integral leads) can be obtained for about 4s. 6d.
Terrapins as pets
by Ian Coggins (13 yrs)

The species of terrapin most commonly seen in pet shops is the Red-Eared or Elegant Terrapin (Pseudemys scripta elegans). This beautiful North American terrapin is a vivid apple-green colour, with a red mark on the side of its head, hence the name Red-Eared Terrapin. Unfortunately these charming creatures are very hard to keep in our British climate, and very few of them survive the first year of captivity. Most of the specimens in shops are no more than babies and are no bigger in circumference than a half-crown.

Housing
The ideal enclosure for these small turtles is an average size aquarium with one to two inches of water in it (or more). In the water should be placed one or two large, flat stones on which the terrapin can bask in the sun. The most satisfactory heating in the tank is that of a lamp which can be rigged up in the hood of the aquarium. A lamp bulb is essential as it gives the necessary heat and light in which terrapins can “sunbathe.” If possible the temperature of the tank should be maintained at approximately 75°F as the chances of survival are far more likely in that heat.

Feeding
The terrapin’s diet should be as varied as possible consisting of very small pieces of raw meat, earthworms and, if possible, water insects. Quantities of grated cuttle-bone should be sprinkled on the raw meat to provide calcium which is vital for the strengthening of the bones and shell. As mentioned before, the Red-Eared terrapin, although being very attractive, is very difficult to keep alive for long and is not really the terrapin for a beginner. However, there are three species which are very hardy and if kept properly can live up to about 25 years. These are the European Pond Terrapin and the Spanish and Caspian Terrapins.

The Black Widow
by Michael M. Clark

The Black Widow (Gymnocorymbus Ternetzi) is, without doubt, a firm favourite among would-be breeders. These fish are extremely attractive when given suitable surroundings but they should not be overcrowded. The body of the fish is silver with two striking lines of black running vertically across it. When the fish is scared, these are apt to fade, but when the fish is stimulated, the bars deepen in colour. The anal fin, which is very long, the dorsal fin and part of the tail fin are also black in appearance.

The Black Widow is fairly peaceful but when breeding these fish, it is advisable to spawn just the single pair at one time as they are likely to attack each other in community. The male fish appears longer in body than the female and, if one disregards the fins, this should be quite noticeable.
When about to spawn, the female may be noticed to be particularly bulging. The Black Widow can easily be bred in a tank measuring about 20 by 8 by 8 inches. Amazon sword plants should be planted in clumps about the tank and the water level should be about 8 inches high. The normal breeding temperature of 80 degrees (F) is sufficient. Soon after the pair have been introduced into their new tank, they will intensify their colours and the male will be seen to spread out its fins and, from time to time, he will chase the female with his snout. Soon he chases her and before long, the pair come together side by side. Now the female expels a handful of eggs which are immediately impregnated by sperm which have been released by her mate. The eggs sink until they land on the leaves of the plants. They are barely visible to the naked eye. The pair, as soon as they have finished spawning, should be removed. Within twenty-four hours the young hatch. They are then visible as they hang onto the leaves and here they feed on their yoke sacs. About twenty-four hours later they swim separately about the tank and come to rest on the bottom. Here the fry should be fed with infusoria or very fine dried food. Dried egg proves very suitable as a first food. One month later, perhaps sixty per cent of the fry will have died but the remainder, which should total around seventy, will grow rapidly and twelve weeks later they will be mature. The Black Widow may reach over two inches in length when full size is attained.

Sea fish that spends its entire life in the belly of another animal
by M. Lorant

There is a fish that spends its entire life—literally from birth to death—in the belly of another animal. The host is most commonly a large, unarmed starfish, almost hollow, about two-thirds the size of a standard football. Some varieties of the same type of fish find homes inside large sea-cucumbers, which are bottom-dwelling echinoderms like the starfish.

The sea-bottom invertebrate parasites belong to the family of pteroides, abundant in parts of the tropical Pacific. Those found on coral reefs around the Marshall and Marianas Islands have recently been described by Dr. Leonard P. Schultz, Smithsonian Institution curator of fishes. These communal fishes, like members of several other families of the area, have almost perfectly transparent bodies. Through their skin one can watch their hearts beat and the circulation of blood.

A favourite host is the starfish Caloecia, which measures about 8 inches in diameter. About half of those brought to the surface by one collector has a pteroid inside them. As more is learned about each species, Dr. Schultz states, it is probable that each kind of pteroid will be found to inhabit a certain distinct genus of invertebrate animal. They live chiefly on food ingested by the starfish. Whether they render any service to the host in return for his feeding is unknown. The association of the two types of animals, however, appears to have been evolved through millennia, and the little fish apparently do their echinoderm hosts no harm.

Owing largely to the obscurity of their habitat, much confusion exists in the classification of the fishes. Not only is it difficult to extract them from known hosts, but almost certainly there are several unknown hosts.

Maintaining the heat
by J. Hems

With thoughts of probable power cuts uppermost in our minds, it is as well to plan ahead. Actually, few fishes suffer any harm by a drop in the temperature of water so long as the drop is gradual. But the drop must not be lower than the minimum for most species, which is 65°F (18°C), if the fish are to come through the experience unharmed. So it is a good idea to maintain the temperature of a tropical aquarium by two or three degrees (F) above the normal in very cold weather to allow for a drop within the lowest possible limit.

Another thing you can do to protect your fishes against chilling is to tag the aquarium with some insulating material to keep the heat in. There is no need to exclude the light. Black fish or several thicknesses of brown paper glued to the bottom of a tank will do a lot to conserve heat. The tank, too, can be protected in the same way. Decorated panels or painted cardboard sheets can be stuck on the end facing the side to preserve the attractive appearance of a tank.

Visit our Stand No. 135 at the Schoolboys and Girls Exhibition at Olympia

Opening 27th December—10th January
Empire Hall 2nd floor

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our readers

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.

Scotland Calling All Sassenachs

ENCOURAGED by the tremendous success which the last edition of the Handbook of the Federation of Scottish Aquarist Societies enjoyed, the council have decided to proceed with more ambitious plans for the next edition to be published in January.

While much of the content will remain directly connected with the F.S.A.S., it is intended to expand the section devoted to the activities of Associated Bodies, such as the British Killifish Association, and the Fancy Guppy Association, to include details of the associations which were overlooked in the last issue.

It is also proposed to introduce a section on Programme Aids, giving information on films and slides which are available for hire to societies.

The Pet Shop Directory will be enlarged to include dealers in England, Wales and Ireland.

Such an undertaking cannot be accomplished without the co-operation of Individual Aquarists, Active Societies and Pet Traders throughout the United Kingdom. To this end a questionnaire was recently sent to societies seeking their co-operation in compiling the necessary information. If your society did not receive a questionnaire, please accept my apologies, as the reason would, no doubt, be beyond my control. If you would care to help, I should be extremely grateful if you will send me details of the following:

1. The name and address of any Pet dealers in your area.
2. The name and address of any Zoo or Public Aquarium in your area.
3. The name and source of any film connected with the hobby which you may have seen.
4. The source of any slides available for hire.
5. Details of any Body or Society associated with fishkeeping.

Entries in the Pet Shop Directory may be made entirely free of charge. Pet Traders have merely to send me details of their business name and address to have these included.

Traders who wish to take advertising space may have particulars on request.

Last year's Handbook was printed to a very high professional standard, and was circulated to some six hundred Aquarists in Scotland. Copies were also distributed in England and America and were well received in these countries.

In an effort to increase the circulation of our Handbook and because we feel that the revised edition will be of interest to aquarists outside Scotland, order forms have been sent to Societies. Those Societies who did not receive an order form and who wish to place an order may do so simply by writing to me. The cost will be £2. 6d. plus 6d. postage, but remittances should not be included with the order as an invoice will be sent with the order. Society orders for eight copies or more will be sent post free. It is regretted that further orders cannot be placed after publication.

All orders should reach me not later than 15th December.

In conclusion may I express the hope that aquarists throughout the United Kingdom will rally to support this bold venture by sending helpful information and by ordering a copy.

ROBERT M. COOPER,
Hon. Secretary,
Federation of Scottish Aquarist Societies,
76 Campus Crescent,
Kirkcaldy, Fife.

Gas Embolism—More Criticism

RECENTLY, it was drawn to my attention by a German friend and fellow aquarium keeper, that British aquarists were very concerned and childish. Upon enquiring the reason for his opinion, he drew my attention to a letter by P. F. Capon in the August edition of The Aquarist.

Having only glanced over the letter in question, I re-read it, and though I do not profess to know the first thing about gas embolism, I agreed with my friend, that the tone of Mr. Capon's letter leaves a lot to be desired.

Would you please draw to Mr. Capon's attention the fact that a great number of foreign aquarists read our magazine, and letters like this do nothing for the reputation of British aquarists in foreign lands, nor, I should imagine, for Mr. Capon's own reputation among aquarists at home.

I would like to conclude by passing on my German friend's suggestion, namely, that Mr. Capon take the proverbial long walk off Scotland's famous pie!

23781000 CPL. LEIGHTON, R. R.M.
Rheindahlen Garrison
Provost Company,
Royal Military Police,
Rheindahlen
B.F.P.O. 40.

Fish Food Costs

I WRITE after nearly 50 years experience as an aquarist.

We all know there are fish foods which are well worth the price. But in assessing the price one must not overlook the fact that in the case of these foods, a great deal of research goes into getting a really balanced diet that will not affect the health of the fish in any way. One must also take into account the costs of packing in small quantities.

THE AQUARIST
Cinerarias
by M. D. C. Jones

CINERARIAS are attractive flowering plants. They flower from December to April, bearing large heads of gay, daisy-like flowers in shades of blue, purple, pink, red and white. Some of the blooms are prettily marked with a ring of contrasting colour. The leaves are large and of a medium-green colour. They need a cool, airy, moist atmosphere if they are to bloom to perfection for a long period. They like a well-lighted, draught-free position but do not like strong sunshine. Over-watering can kill these plants and so one should wait until they start to flag before watering.

Although cinerarias are comparatively easy to grow successfully they have one big disadvantage in that greenfly and leaf-miners are often a nuisance and they are almost certain to make an appearance sooner or later. As soon as they are noticed the plants should be removed from the fish-house and sprayed with a suitable insecticide.

If one wants to acquire one or more cinerarias to use as added decoration in the fish-house, one can buy plants from a reputable florist or raise a few plants from seed sown between April and July. When purchasing a plant look for a healthy sturdy specimen, free from pests and discoloured leaves. If the plant carries plenty of buds these will open during the next few days and provide a long-lasting display of flowers.

If seeds are sown, John Innes seed compost can be used and the seeds should be covered very lightly with a layer of the compost. They will germinate rapidly in a temperature of about 60°F. The plants should be potted on into larger pots containing John Innes potting compost No. 2 as growth develops. They can be potted into their final pots (5 or 6in.) at the end of the summer. Use well-drained pots and pot firmly but not too deeply. Feed the plants with a liquid fertiliser when they are carrying flowers, and remove dead blooms regularly.

Cinerarias can be kept from one year to the next, and indeed I do this if I have an exceptionally fine plant, but normally the best results are obtained by discarding the old plants after they have flowered and replacing them with new ones.

Limnephilus—caddis fly larva
by Bill Sims

LITTLE bundles of pebbles or sticks, apparently moving under their own volition, are quickly recognised by the aquarist as larvae of the caddis. Altogether there are about 190 kinds of caddis fly in Britain, all of them slightly different; but differences in the larval case are no clue to the species for the case structure is governed more by prevailing conditions and materials than by type. However, there are two main divisions: those with head bent at an angle to the body in the larval state, called cruciform; and those with head and body in a straight line, called campodeid.

The bent head larvae always have a case to protect the soft abdomen but the straight larvae are mostly free-living, though just a few kinds do have cases. Algae, and portions of plants, either fresh or decayed, are the food of the bent head types, so it will be seen that in aquaria or ponds there are comparatively harmless.

This present caddis fly larva, one of the Limnephilus species, belongs to the cruciforms, or bent head group, and always makes a case. It is formed from silky threads which, when extruded as fluid by the larva under water, harden into elastic threads. The particles of grit or stick we see are deliberately placed and stuck on the outside.

In still or quiet water the plants used are generally pieces of plant life, as being lighter to carry. Those that inhabit fast running water, however, use pebbles to give them more anchorage. When the larvae are small only a tiny case is needed. During growth more length is added to the head end, and this is necessarily wider. Eventually the thin end becomes unused, and as it becomes unwieldy parts of it are bitten off.

The drawing shows one of the liminiphilus kinds of caddis fly larva without its case. The fluffy filaments are used to keep its grip on the inside of the case, and are so efficient that the creature cannot easily be pulled out. The line of hairs along its side are gills, with which it extracts oxygen from the water.

To change into an adult the larva must pupate, and it does this inside the now large case. Both ends are sealed up but holes are left for water to flow through. The case is stuck to the bottom of the stream or pond.

After 2 to 3 weeks the newly formed pupal stage breaks out of the case and swims or crawls away. It makes its way to the surface up water plants and there the pupal stage splits open to allow the fully adult caddis fly to emerge.
Great Silver Beetle
by F. Wilmott

This fine insect has been given its popular name because a large area of its undersurface is closely covered with very short hairs which it uses to store a layer of air, with which the body may be saturated. If it catches the light when the beetle is submerged.

The Great Silver Beetle can attain a length of nearly two inches but it is, unfortunately, not so common in this country as the male Stag Beetle, but even so the Great Silver Beetle (both male and female) wing cases on itself, and can be said to be the slow, peaceable elephant of British insects.

This beetle moves its legs alternately when it swims instead of working them in unison, and this action combined with its bulk makes it slower and more awkward-looking swimmer than are some other aquatic beetles. Also it tends to clamber amongst the water plants on which it mostly feeds in preference to swimming.

The clubbed portions of this insect's antennae (which it keeps tucked under its thorax), the underside of its thorax, and also part of its abdomen are thickly covered with short downy hairs. These down-covered areas serve as air passages connecting the antennae with an air space between the wing cases and the upper surface of the insect's body.

The way in which the Great Silver Beetle "fills-up" with air is most interesting. For firstly it rises to the surface of the water and pushes the clubbed portion of one antenna through the surface-film. Then it moves its wing-cases in a bellow-like movement which causes its whole body to rise and fall in the water as new air is drawn in and "used" air expelled. After repeating these breathing movements several times this remarkable beetle, presumably refreshed, descends with an abundant supply of air.

Hydropsia pendens (male on right)

Breeding slow-worms in confinement

As first feeding the tiny animals presented a problem. To begin with they were kept alive on fruit flies but supplies of these were limited and an alternative diet soon became necessary. The difficulty was resolved by the discovery that a pile of spent mushroom manure, stacked in the garden until such time as it should be needed by the gardeners, was simply crawling with minute forms of animal life. A couple of handfuls of this medium placed in the cage every other day, supplied the baby slow-worms with a completely adequate diet and they soon began to increase in size so that by 9th September they averaged three and a half inches in length.

Towards the end of September one of the adult slow-worms was discovered in the act of eating a young one. A little of the tail of the victim remained protruding from the adult's mouth and, in a matter of seconds, even this last trace of the unfortunate animal disappeared. To prevent a repetition of this cannibalism the rest of the babies were haphazardly caught up and moved into the nursery cage where at the time of writing they continue to flourish.

The young slow-worms are voracious little animals. Not long ago one, no more than four inches long, was found attempting to eat an inch long slug much thicker in diameter than itself. The tiny mouth of the slow-worm was firmly clamped on its prey which it made vigorous attempts to swallow. Finally, however, it seemed to realise that the stout, tough body of the slug presented insurmountable difficulties and it reluctantly gave up the attempt.

Apart from supplying a rich source of live-food for the young slow-worms, the spent mushroom manure provides an excellent covering for the floor of their cage. It is a warm medium and sufficiently loose in texture to enable them to burrow into it without difficulty. Although their are frequently seen moving over the surface during the day, they spend much of their time coiled up beneath its protection.

It seems that slow-worms are not difficult to breed in captivity. Most probably the female introduced in June was already carrying young at the time she was captured but this is unlikely to have been so in the case of the earlier caught female.
**Aponogeton ulvaceus**

by B. Whiteside

One of the most beautiful plants for the tropical aquarium is surely *Aponogeton ulvaceus*. The genus *Aponogeton* contains a number of decorative aquatic plants, including the famed lace plant but even it, I think, fails to equal the beauty of a well grown plant of *A. ulvaceus*.

As plants of this genus produce a swollen tuber and are often sold in this condition without leaves, it is not easy to obtain true plants of *A. ulvaceus*. Plants must be bought from a specialist dealer as some of the smaller firms sell tubers of what they think are *A. ulvaceus* but which may turn out to be another species or a hybrid plant of two different species. Plants of the true species may cost up to 10s. 6d. each and are more suited to the larger aquarium but, given suitable conditions for growth, it is not uncommon for the plant to produce flowers which may be pollinated with a small paint brush when fertile seeds may result. Flower heads of *Aponogeton* species may have single or double flower spikes, the latter being produced on the African species.

The plant has pale green, almost transparent leaves with the petiole about 8in. long. The lamina is twisted and wavy and can reach a length of over 12in., by about 2in. broad. New leaves are produced in ample succession and the plant can carry many leaves at one time. Each flower spike is about 2in. long and yellowish white in colour, being made up of numerous single flowers. My plant has produced a succession of four flower spikes inside about eight weeks. Each was removed to prevent the plant from wasting its food reserves on seed production but it still continues to produce more flowers. No attempt has been made to pollinate the flowers or to produce seeds, although it is said to be quite easily done.

Plants need a period of rest each season and when growth appears to die down, the tuber should be removed, say, a jar of cooler water for about five or six weeks after which it can be returned to the warmer tropical aquarium and the tuber planted about 1in. to 1½in. beneath the surface of the gravel.

Conditions under which the plant has flourished and flowered are as follows, for a 30in. x 12in. x 15in. tank—temperature 78°F.; pH 7.4; DH 8°; gravel CaCO₃ free; (no sub-gravel filter or food present); lighting from tungsten bulbs totalling 65 watts for nine hours per day, with about three hours of natural sunlight. The tank was quite well populated with fish whose diet was mainly of dried foods.

If you have a fairly large aquarium with conditions similar to the above, and are willing to spend 10s. 6d. on a plant, then I can recommend *Aponogeton ulvaceus*. Not only is it a long lasting and beautiful plant, but it has the added attraction of being as easily brought into flowering condition as any other tropical plant I know. The prospect of hand pollinating the flowers, producing fertile seeds, and perhaps raising some new plants from these, gives yet a further reason for trying this beautiful and not too easily obtained plant.

I have just seen an advertisement by a dealer offering three species of *Aponogeton*, including *A. ulvaceus*, at 2s. 6d. each. If the latter is the true species it would certainly be a good buy.

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**Fish food review**


New fish foods are not uncommon on the market at the present time, but this recent introduction is certainly original from a visual aspect. The food consists of small blocks of what look to me like pieces of filter. They can be torn or cut into smaller pieces depending upon the number of fish to be fed.

A small block of the food is immersed in the aquarium water and pressed against the glass side or front of the tank to which it will stick. The dried blocks soon soften in the water and when noticed by the fish are soon the centre of interest. Small pieces of the freeze-dried worms are removed and eaten by the fish with relish. The piece of food may become unstuck from the glass and usually floats to the water surface where it is soon found by food-hunting fishes. The block of food will usually remain intact unless attacked by larger fish such as angels. After such vicious attacks the food is inclined to disintegrate into separate worm segments, but these are quickly attacked by the smaller fishes.

I have found the food to be useful if small pieces are cut off and allowed to float on the water surface in tanks where smaller fishes such as neon, cardinals, pencil fish or young livebearers are kept. Such fish are unable to deal with the larger live tubifex worms and seem better able to manage the smaller segments released by this freeze-dried food. Larger fish seemed to be keener on attacking larger blocks of the food.

Although rather expensive at 5s. 6d. per container, this form of tubifex is certainly much more handy than the more conventional live form although one would assume that its value as a food would be less than live tubifex. As an addition to the normal range of dried foods 'Miracle Freeze-Dry Tubifex', which is made in the Republic of China, provides an apparently appreciated diet change for aquarium fishes.

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THE AQUARIIST
Freshwater to saltwater conversion
by Alchemist

OVER the past year or so marine fishkeeping has become an increasingly popular branch of the aquatic hobby
and, with suppliers now catering for the new demands and
societies formed to cater for the marine aquarist, it looks
as if it is here to stay. However, many people do not
realise that there are a number of so-called “ordinary”
tropical fish that can easily be adapted to a marine environ-
ment and quite a large proportion of these species, in fact,
rather better in a marine tank than in fresh or brackish
water conditions, growing at a faster rate and having more
immense colorations.

Among the more common of the adaptable species we
find the following: Mollenhuisia (M. sphenops, canauma,
diplogema, valfera), Tilapia (T. mossambica, T. zilli,
T. aequimani), Chromis (Eupetrops maculatus, E. variegata),
The Fundulids (Fundulus Chelum, F. heteroclitus), and
the Rainbow fishes (Telemarchus, Bedotia, Melanotaenia).

Among the less common but easily adaptable: The Scatoph-
agulus (Scatophagus), the Tetraodonidae and the Monodactylidae
(Tiburones and Malaysian Angelfish), Therapona, Archer fish,
Glossfish and the Siamese Tiger Fishes. If you are going
to attempt to convert any of these species to a marine
environment it must be done gradually, and the most
successful method I have found is as follows.

The tank in which you are going to convert your fish
should contain some water from its existing tank (making
sure the tank is only half-full) a thin layer of gravel and a
filter or aerator (I prefer the use of filters with built in
airstones for this purpose). For the first couple of days
you let the fish get accustomed to its new surroundings.
During this period only feed lightly, preferably with live
Daphnia or encrustations. After this period you raise the
water level in the tank one inch by the addition of seawater of a density of 1.025. You repeat this process once every
two days until your tank is full. You then denite two
thirds of the water out and throw it away. Then add an
extra two inches of seawater to the tank daily until it is
once again full. The water in your tank should now have a
density of between 1.024 and 1.028. The fish can then
steadily be transferred to the marine aquarium as long as
this is done over a period of a couple of hours or so.

The above mentioned process ensures a gradual change
which does not affect adversely the metabolism of the fish.
The one exception to this process is the common eel
(Anguilla anguilla) which defies all and sundry by surviving
even when transferred direct from fresh to salt water or
vice versa. This process can also be reversed for certain
marine fishes although the lengths of time would have to
be considerably increased. The common blenny or
shanny, and the shore gobly, both native to our own shores,
have been successfully acclimatised to water of density
1.007, and certain marine damselfish have also been
acclimatised to comparatively fresh water of density
1.010.

Why not try for yourself?

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Hobbyist and trader relations

purchases. The time-honoured phrase, “The customer
is always right”, unfortunately is sometimes disregarded.
This last comment is as I hasten to add, in the minority of
cases.

However, with reference to the last remark, let me quote
an example. In an effort to enable the majority of my
own clubs to visit one of the largest retailers who consistently
advertised their large variety, etc., we ran a coach trip.
This was on a Sunday but arranged to conform with the
advertised opening hours, using the M.1 and M.45 to
ensure prompt arrival. The idea being that club members
would go in small parties of about six at a time and when
they had done another party to circulate and see giving
everyone a chance to see and buy what ever they fancied
that perhaps is unavailable in our own area. The pro-
propinquity happened to come out to the front and saw the coach
gp up. He at once became very abusive before our
persons could be made known. After some quite
unnecessary ugly words, our members were permitted to
start circulating through the display house in groups.
They found the selection very poor. The finishing touch
was when some members saw species they wished to
purchase and pointed them out to the staff they were told
that they couldn’t buy those particular fish but that similar
ones would be brought out of the fish houses out the back.
This quite naturally the majority did not agree to and the
club left after an extremely disappointing and frustrating
visit with hardly a purchase, if any, being made.

The coach party was about forty-five strong plus one or
two children. Allowing for this and a few wives there
were about forty people prepared to spend a pound upwards
on fish. One of two would have spent considerably more
as they had been saving for the trip in great expectation.
I should have thought that forty pounds worth of business
plus would be considered more than worthwhile in any
retail trade of this nature.

In spite of all these arguments our hobby is steadily
making popularity. Thus, it seems, that the time is ripe
for serious reflection. Isn’t it time we buried the hatchet
all round and tried again? If retailers find any particular
club to behave badly then ban that club from future visits.
Don’t penalise clubs as a whole. The clubs up, down and
cross the country surely form the hard core of interest and
ensure the popularity of the hobby. All the various clubs
should also play their part in ensuring that these outings
are not treated as a look-and-see-only trip but should plan
to buy a few specimens per head with the proviso that
the variety, quality and cleanliness is there.
The Bristol shubunkin
by A. Boarder

THIS fish is one of the most handsome of the fancy goldfish and can be kept in an outdoor pool as well as in an indoor tank. Its striking colours are so different to the usual goldfish that the fish is very attractive at all times. Although the shubunkin is a very popular fish it is surprising how few really good ones are seen on the show benches today. Many fishes exhibited in the class are often quite void of the necessary colours being a dingy brownish hue and not showing either the blue or even red which is required. At two shows this season I have seen a few very good ones and at the Harrogate show at Tottenham and at the Brent show at Willesden I saw at least a few fishes which were very pleasing to see and which appeared to be very close indeed to the standards.

The fish I placed first at Tottenham was a beautiful shubunkin with the stream-lined body, well shaped caudal fin and a brightly coloured body. The ground colour was a fine bright blue and red, brown and violet in lesser degree. The whole fish was splashed with black. This fish showed no scales at all and also had soft gilt plates. It is so rare these days to find a really good coloured shubunkin which has not at least a few visible scales and hard gilt plates. Many otherwise excellent fishes are down-pointed because of showing a few hard scales and hard gilt plates. At the Willesden show I saw another fish which was also a splendid specimen and if it had not shown a very small mark in the lower lobe of the caudal fin, I would have put it forward as the best fish in the show.

It is rather difficult to carry the image of a particular fish in one’s memory for some time, especially if many other fishes have been examined between, but I feel almost certain that it was the same fish which I admired and awarded first prize at both these shows. In any case I feel certain that both fishes came from the same stable, even if they were not identical. The shubunkin should have a slimmer body than the common goldfish and the upper and lower contours should be equally shaped. This means that the fish should not be humply backed or mousy, a common fault which is often seen. There should be no visible scales but it is a fact that many of the better coloured ones will show a few such scales and are usually down-pointed for this reason. The gilt plates should also be soft, that is not showing the hard, scaled appearance, but be almost transparent. Some fishes are seen with one soft and one hard plate whilst others can have part of the gilt plate soft.

I find that many of the shubunkins on show recently have a fairly well shaped body but fall down badly on colour. I consider that colour is the most important feature, as without the desired ones the fish is not shubunkin. I feel that colour should receive more points than are allotted in the Federation standards and a return to the old ones would be an advantage.

Under the previous standards of 1947, the points for colour were 35, but under the newer standards only 20 are allotted. Also, in the earlier ones 5 points could be given for soft gilt plates whereas the new ones allow nothing for this feature, and one can only reduce points from those for the body. The caudal fin of the Bristol is another outstanding feature and under the old standards received up to 20 points and the other fins another 20 points. The newer ones also allow points for condition and deportment. I consider that points for condition only should be allowed for all fancy goldfish as I have yet to see a fish with a good deportment which was out of condition.

I have judged many classes of shubunkins and the point system I would like to see introduced for these fishes would be as follows—

Body: 20  Colour: 35  Caudal fin: 15  Dorsal: 5
Other fins: 10  Soft Gilt Plates: 5  Condition: 10
Points can be deducted for visible scales.

With this point system it would not be difficult for any judge to mark up a fish and the better coloured fish would be placed above the poorer coloured one. The earlier description for colour was—Blue ground splashed with black; interspersed with violet, red, brown and yellow. The later standards gave—A bright combination of blue,

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Change of fashion

by D. E. Sale

TEN years ago I reluctantly sold my collection of fish and left home in search of education. Early this year I re-entered the hobby not really knowing what to expect after so long a break. Change is often so gradual as to be imperceptible, but after ten years I imagined that the hobby would have altered in many ways. I have noticed changes in almost every aspect of fish-keeping. Firstly, a consideration of the varieties of fish commonly available. Many fish which, ten years ago were considered true specialists' fish, are now not only readily available at reasonable prices, but are easily and frequently bred without too much trouble. I am thinking particularly here of the moorhcas. There is a strain of Aphoyosoma callinerum in this West Midlands town which not only thrives in the rather hard water of the district, but which spawns at every opportunity without undue preparation. I have had these fish, and Rhamdus Milius, spawn regularly although I have had little time to condition them, and have certainly not given them the party water the text-books consider essential. They appear to be able to adapt themselves to water conditions generally considered unfavourable to the species. I have in one tank Neons and Corydoras, both in excellent condition, although their text-book requirements are very different.

With the growing popularity of tooth-carpas some of the other species have become far less common. I have tried, with no success, to obtain Mosquito fish, Blue Llamias, and Merry Widows, all easily-bred fish which were once second only to guppies in numbers in this area. Also, many of the Characins, especially Becons and Harlequins, have become quite scarce. (I am not speaking here of the special shops but of the local enthusiasts and breeders who ten years ago always had a tank of each of these species.)

There appears also to be a growing interest in the bottom-dwellers. Whereas in a shed of twenty tanks there would, ten years ago, have been perhaps half-a-dozen Corydoras present, there are now commonly twenty different species.

Live-bearers, especially guppies and platies, have in ten years altered beyond belief. Obviously some careful breeding has been going on. I remember in the past that the birth of a brood of platies was a matter of great interest. A red platy was likely to produce a motley collection of albino, red, yellow, wagtail, spotted and unclassified. My present platies, obtained from several sources, have so far been quite true with the exception of a blue platy whose young give clear evidence of a juvenile indiscretion. Swordtails, too, appear to be far more reliable than they used to be. Nearly all the female guppies in the district have coloured tails; ten years ago this was a great rarity. Male guppies appear to be following the same pattern although they have been told that their finnage is not always handed on so reliably. Apart from these fish, there appears to be little interest in livebearers at the moment.

It seems that today, to be assured of popularity, a fish must be, as well as attractive in appearance and disposition, either somewhat difficult to breed, so as to present something of a challenge, or so eager to reproduce its kind that line-breeding to perpetuate a certain feature is easily achieved. The reason for this is almost certainly the decrease of the single aquarium kept for decorative purposes only, and the tremendous increase in the numbers of breeders who, quite naturally, like to have something to boast about.

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The Bristol shubunkin

by A. Boarder

violet, red, yellow and brown. Not a lot of difference really except for the blue ground.

When breeding shubunkins it is most important for the breeder to call the youngsters at an early age. Fortunately for him these fishes change colour at a much earlier age than do scaled fishes. In the latter case one may have to wait for at least two years before a fish obtained its real colour, but the shubunkins show at an early age this colouring and so can be sorted out in good time. This enables the breeder to concentrate on a few of the best.

The body shape will be apparent at about three months of age and the colour should also be showing up well by then. Some fishes become very pale and transparent looking at an early age. It is very unlikely that these will ever make good coloured specimens. Once they get silver coloured they do not become darker but the fishes which are likely to make the best coloured ones are those which look quite dark when others of the same breed are light in colour. A good shubunkin should show the blue etc., when a year old and be at its best by two. If a fish has not taken on the required colours by the age of two it is unlikely that it will ever do so.

The shape of the caudal and dorsal fins will show up well when the fish is about six months old providing it has been well cared for. The caudal should be fairly large with broad lobes, rounded at the tips. The dorsal should be bold erect and fairly well developed. The minimum length for exhibition under the lower standards is three inches body length excluding the tail. A large good fish should be at least a good one but a bad large one should never be a small good one.

December, 1966

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Book review

"Breeding Aquarium Fish," by Dr. Wolfgang Wickler, translated and edited by Dr. Dennis Tucker and published by Studio Vista Limited, at 10s. 6d.

This paperback book, 'Breeding Aquarium Fish,' is sub-titled 'An introduction to the biology of their reproduction.' The author is a scientist who is a specialist in fish behaviour and it is with this which the book largely deals. It is not a book which basically sets out to tell you how to breed your favourite fish, whichever it might be, although the book does contain several pages devoted to what have been found to be conditions under which various kinds of fish have been bred. The work rather seems to hope to encourage the aquarist to think about his problems of fish breeding, and to solve them with a scientific approach i.e., not so much the 'how' of fish breeding but rather the 'why' and 'what'. With this new aim in view the author presents his material, little of which I have before seen in print.

As the book was originally written for the continental reader, many of the details are given in the decimal scales e.g., lengths in centimetres, volumes in litres, and temperatures in degrees Centigrade. Fish are often called by their zoological names and one would need to have a reference book and conversion tables at hand to convert scales and names from the unknown to the known. I am not here decrying the work of the translator who has obviously taken a lot of trouble to make clear many of the difficulties the average aquarist would tend to encounter throughout the book.

The book has 110 pages—divided into 16 sections, a four part appendix, a bibliography and an index. Four photographs and nineteen text figures supplement the writing, and the cover of the book has a colour photograph of a pair of Siamese Fighting Fish mating.

The book's 16 sections deal with a variety of topics. Section 2 deals with the meaning of aquatic plants to fishes and has some interesting aspects on the aeration of aquaria, as well as a number of reasons for having plants in aquaria. A discussion on breeding tanks questions some of the standard techniques, in section 3. A footnote to section 4, by the translator of the book, Dr. Tucker, on water conditions as regards pH and hardness, is very useful. His classification of named water hardness levels, compared with the 'DH scale, should be very useful. No other books on aquatic topics which I have read, (although I may have missed the appropriate ones) give a standardized rating of 'DH scales with named hardness levels of water.

Perhaps if all aquarists used this classification we would have a more accurate idea of what was meant by such phrases as moderately soft, hard, or moderately hard etc. waters.

Another part of the book deals with selection of fish in the aquarium. Here the breeding of naturally occurring mutans is discussed. Included in the next section is the emphasis which the author places on a scientific approach to the evaluation of results obtained in successfully breeding certain fish. He emphasizes the effect of the mood of the fishes on their readiness to breed, as well as external stimuli. The following part of the book deals with, amongst other items, experiments carried out on the breeding behaviour of sticklebacks, using dummy models to induce breeding behaviour.

Section 10 deals with lighting of aquaria and light rhythms. It includes details of the effects on the swimming angle of fishes, due to their aquarium being lighted from the sides, also of the effect of light rhythms as a spawning incentive. The following section covers seasonal changes including day length and temperatures as factors in inducing breeding condition.

Fighting habits of fishes is fully dealt with in the 13th section of the book, and includes details of spawning territories chosen by specific fish. The next part of this paperback is devoted to the courting of fishes, and in some cases, to the care of their young. Section 15 is about the cross breeding of fish of different species and the desirability or undesirability of such crosses, and contains an interesting account of a new species of Molly which produces only female young. In the last section of the book the author encourages aquarists to study their fish and to discover all that they can about them.

In conclusion I would suggest that this is not a hand book on how to breed fish; but to those interested in the behaviour of fish as regards their breeding, it can be recommended. It presents the findings of scientific studies of fish and such material would probably be of interest to the established aquarist who would like to learn as much as he could about his aquarium fishes.

Oyster-dredging

by R. D Maynard

The "O" 's are in this week!

To the uninitiated, "O" might mean oysters, but to those in the know, it means something quite different! The Colne Fishery Company is a unique institution. The above phrase simply means that members whose surnames begin with "O" have their turn to do a week's oyster-dredging. All members are sons, sons-in-law, or bear some other relationship to all other members, so it is really a family Company!

The dredging itself is a very interesting operation and lasts from September until the end of April. It is done from Puffin, a vessel which is the property of the Fishery Company. The dredging takes place in the Colne River, and is usually done behind the smacks which are attached to the rope. Small oysters, called brood are put aside to be transferred later to the Puffin for fattening. Later, these will be moved once again to the pits, awaiting sale. These are the famous "natives."

The oyster's chief enemy is the starfish which will prise open the oyster's shell, and eat the occupant!"
from AQUARISTs' SOCIETIES

68 pns, Eelgrass Towp Carp (male); I. W. Parker (T.A.R.B) 74 pns, 8. L. Read (Tul- keth, Huddersfield) 72 pns, 8. A. G. Parker (Blackpool) 66 pns, 8. R. J. Read (T.A.R.B) 64 pns, 8. I. W. Parker (T.A.R.B) 62 pns, 8. D. R. Read (Blackpool) 60 pns, 8. J. C. Read (Huddersfield) 60 pns, 8. A. G. Parker (Blackpool) 58 pns, 8. J. C. Read (Huddersfield) 56 pns, 8. D. R. Read (Blackpool) 54 pns, 8. J. C. Read (Huddersfield) 52 pns, 8. A. G. Parker (Blackpool) 50 pns, 8. D. R. Read (Blackpool) 48 pns, 8. J. C. Read (Huddersfield) 46 pns, 8. A. G. Parker (Blackpool) 44 pns, 8. D. R. Read (Blackpool) 42 pns, 8. J. C. Read (Huddersfield) 40 pns, 8. A. G. Parker (Blackpool) 38 pns, 8. D. R. Read (Blackpool) 36 pns, 8. J. C. Read (Huddersfield) 34 pns, 8. A. G. Parker (Blackpool) 32 pns, 8. D. R. Read (Blackpool) 30 pns, 8. J. C. Read (Huddersfield) 28 pns, 8. A. G. Parker (Blackpool) 26 pns, 8. D. R. Read (Blackpool) 24 pns, 8. J. C. Read (Huddersfield) 22 pns, 8. A. G. Parker (Blackpool) 20 pns, 8. D. R. Read (Blackpool) 18 pns, 8. J. C. Read (Huddersfield) 16 pns, 8. A. G. Parker (Blackpool) 14 pns, 8. D. R. Read (Blackpool) 12 pns, 8. J. C. Read (Huddersfield) 10 pns, 8. A. G. Parker (Blackpool) 8 pns, 8. D. R. Read (Blackpool) 6 pns, 8. J. C. Read (Huddersfield) 4 pns, 8. A. G. Parker (Blackpool) 2 pns, 8. D. R. Read (Blackpool) 1 pns.

THE Belgrade and Redhill A.S. has been "settling together" with other Aquarist Clubs in the area. This was the first: an intimate house party and Mid-Summer Spectacles. The main event of the evening was a presentation of Bubblers and Redhill A.S. Members were Mr. Roy Bag (Kingston) for his magnificent fish and breeder, and Mr. George Ross (Redhill) for his plants. On the October a party from Porchester A.S. visited Belgrade. Though somewhat delayed in arrival due to traffic congestion in the streets, the dinner was served promptly, and a slide show of the Belgrade's activities was shown. A party and a huge fish and plants supplied by both societies.

A full table was also held with each club bringing 12 tropical and 12 coldwater species. The show was judged by Messrs. C. Brown, and Mr. H. Davis, and the winner was for the most in both sections.

The results of the October show have been published in the "Aquarist" and "Aquascape" and will be published in the "Aquarist" and "Aquascape" for the November issue.

THE Society of the Newcastle upon Tyne Aquarium Societies, held its annual Challenge Cup and Livebearer Society was the host for the first time. The show was to be a very successful event and there was a total of 166 entries. There were 11 classes and another class for the best fish in show, and in addition a mounted medalation for the best in show.
THE guest speaker at the October meeting of the Newport A.S. was Mr. Richard Wing, chairman of the South Wales Tropical Fish Study Group, who gave a review of the first four years of the society. The society's first meeting was held on 22nd April 1967, and the inaugural meeting was held on 2nd November of the same year. The society has continued to grow and now has a membership of around 150. Mr. Wing gave a detailed account of the society's activities, including the annual society show, which has become one of the highlights of the society's calendar. He also mentioned the society's regular meetings, which are held on the second Tuesday of each month, and the visits to fish dealers and other fish-related events.

Mr. Wing also discussed the importance of education and raising awareness about tropical fish and their care. He highlighted the role of the society in promoting responsible aquatic practices and the importance of conservation of marine and freshwater habitats. The society has also been active in raising funds for various conservation projects and has donated a significant amount of money to such causes.

In conclusion, Mr. Wing expressed his gratitude for the support he received from the members and the local community. He emphasized the importance of continued support and involvement to ensure the society's continued growth and success.

Mr. Wing's lecture was well received by the audience, and the meeting was followed by a healthy social gathering.

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THE second annual general meeting of the Veil and District A.S. was held at the Veil on 22nd November, with Mr. G. B. Brill serving as the chairman. The meeting was held in the Veil's new extension. The chairman opened the meeting by welcoming the members and the guests. He then proceeded to give a detailed account of the society's activities and achievements during the past year.

The chairman also discussed the society's future plans and objectives. He emphasized the importance of education and raising awareness about tropical fish and their care. He highlighted the role of the society in promoting responsible aquatic practices and the importance of conservation of marine and freshwater habitats. The society has also been active in raising funds for various conservation projects and has donated a significant amount of money to such causes.

In conclusion, Mr. Brill expressed his gratitude for the support he received from the members and the local community. He emphasized the importance of continued support and involvement to ensure the society's continued growth and success.

The meeting was followed by a healthy social gathering.
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**HEATERS**

<table>
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**FRY FOODS**

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<tr>
<td>Mixture No. 2</td>
<td>2-6</td>
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</table>

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**December, 1966**

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E.C.D.—Early closing day.

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CHESHIRE

Grasby, Joe, F.R.H.S.
"The Glen" Fisheries, Mobberley, Nr. Knutsford
Tel.: Mobberley 3272 W. C.T.P.A.A. R.A.A.

CORNWALL

Marine Facilitiess Ltd.
Commercial Buildings,
Custom House Quay, Falmouth
Telephone: Falmouth 88
E.C.D. Tuesday (In winter only) WR. T. P. AA.

DEVON

Plymouth Tropicales
North Hill Nurseries, Tavistock Road, Plymouth
Telephone: Plymouth 62663
Closed Wednesday. R. C.T.P.A.A.

DORSET

Noah's Ark Aquarium
Swanery Car Park, Weymouth
Telephone: Weymouth 3018
Open Daily. R. T. P. AA.

DURHAM

The Fish Bowl
Bardon Road, Sunderland
Telephone: Sunderland 71026
E.C.D. Wednesday (All day), WR. C.T.P.A.A. R.A.A.

Monsall, G. R.
187, Northgate (near Minories Garage)
(On original A.1 road) Darlington
Telephone: Darlington 5991

ESSEX

Goodmayes Aquarium
70 Grove Road, Chadwell Heath
Telephone: Goodmayes 2594
E.C.D. Thursday. R. C.T.P.A.A.

Shilton, C. J., Aquarist
139, Galleywood Road,
Chelmsford
Telephone: Chelmsford 56878
E.C.D. All Day Saturday. W. C.T.P.A.A.

Stan's Aquarium
466, Southchurch Road, Southend-on-Sea
Telephone: Southend 67859

GLOUCESTERSHIRE

Cheltenham Aquatics (Prop. Mr. B. R. James)
10 & 11, Suffolk Parade, Cheltenham
Telephone: Cheltenham 24949
Closed all day Monday R. C.T.P.A.A. R.A.A.

HAMPSHIRE

Arundel Aviaries & Fisheries (Taylors)
241/243, Arundel Street, Portsmouth
Telephone: Portsmouth 20047

Bridgemary Pet Stores
56, Gresham Avenue, Gosport
Telephone: Fareham 4791
E.C.D. Wednesday. R. C.T.P.A.A.

Ningate Zoological Supplies
7, Market Street, Winchester
Telephone: Winchester 2406

HERTFORDSHIRE

The Pet Shop (R. S. Colton)
68/68b, London Road, St. Albans
Telephone: St. Albans 53507

KENT

Gillingham Pet & Aquatic Centre
(Proprietors F. & E. Alderman)
125, Canterbury Street, Gillingham.
Telephone: Medway 52049
E.C.D. Wednesday. R. C.T.P.A.A.

Kingsfisheries Aquarium
138, Croydon Road, Beckenham
Telephone: Beckenham 3716
E.C.D. Wednesday (All day). R. C.T.P.A.A.

Sherwood Pet Stores
(Proprietors, Fairburns Aquaria, Ltd.)
252, Sherwood Park Avenue, Sidcup
Telephone: Bexley Heath 7217

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Hornby's
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Manchester, 16
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Geoff, K. T.
30, Hewett Avenue, Wood Green, N.22
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Weekends only. R. T.P.A.A.

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Upper Yatton, S.W.7
Telephone: Bath 7334
E.C.D. Wednesday. WR. C.T.P.A.A. R.A.
Tachbrook Tropicals Ltd.
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(Open all week except Sundays). WR. C.T.P.A.A. R.A.
Windmill Products
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London, S.W.1
Telephone: Victoria 5179
(Open all week, except Sundays). W. A.A.

LONDON (West)
Aquasets
17, Leisland Road,
West Ealing, W.13
Telephone: Ealing 2748
Chiswick Aquarium
156, Chiswick High Road,
London W.4
Telephone: Chiswick 6549 WR. C.T.P.A.A. R.A.A.
Owen Reid's Aquarium Dept.
12, Spring Bridge Road, Ealing Broadway, W.5
Telephone: Ealing 3259

NORTHAMPTONSHIRE
The Aquarium
192, Wellingborough Road,
Northampton
Telephone: Northampton 34010
The Pet Shop
120, Ketton Road,
Northampton
Telephone: Northampton 38841
E.C.D. Thursday. R.C.T.P.A.A.

OXFORDSHIRE
The Goldfish Bowl
9, East Avenue, Cowley Road,
Oxford
Telephone: Oxford 41825
E.C.D. Thursday. W.R. C.T.P.

STAFFORDSHIRE
Wolverhampton Aquatics
147, Horsley Field, Wolverhampton
Telephone: 24147
E.C.D. Thursday. WR. C.T.P.A.A.

SURREY
Aquasets
1, Grand Parade,
Towpath
Telephone: Elmbridge 0678
Thameside Tropics and the Pet Shop
Birchley House, New Zealand Avenue,
Waltham-on-Thames
Telephone: Waltham 24076 R. C.T.P.A.A. R.A.

SUSSEX
Dowling, Conrad A.
1, St. John's Terrace,
Lewes
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Worcestershire
The City Aquaria
143, Melbourne Road, Coventry
Telephone: Coventry 72772
E.C.D. Thursday. WR. C.T.P.A.A.

YORKSHIRE
The Corner Shop (Prop. J. Wilde)
526, Abbeydale Road, Sheffield, 7
Telephone: Sheffield 54172

SCOTLAND
Aquaria's Rendezvous
16k/16h, Albert Drive, Pollokshields, Glasgow, S.1
Telephone: South 4258
E.C.D. Wednesday. R. C.T.P.A.A.

NORTHERN IRELAND
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15, Montgomery Street, Belfast
Telephone: Belfast 27144
E.C.D. Wednesday. WR. C.T.
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