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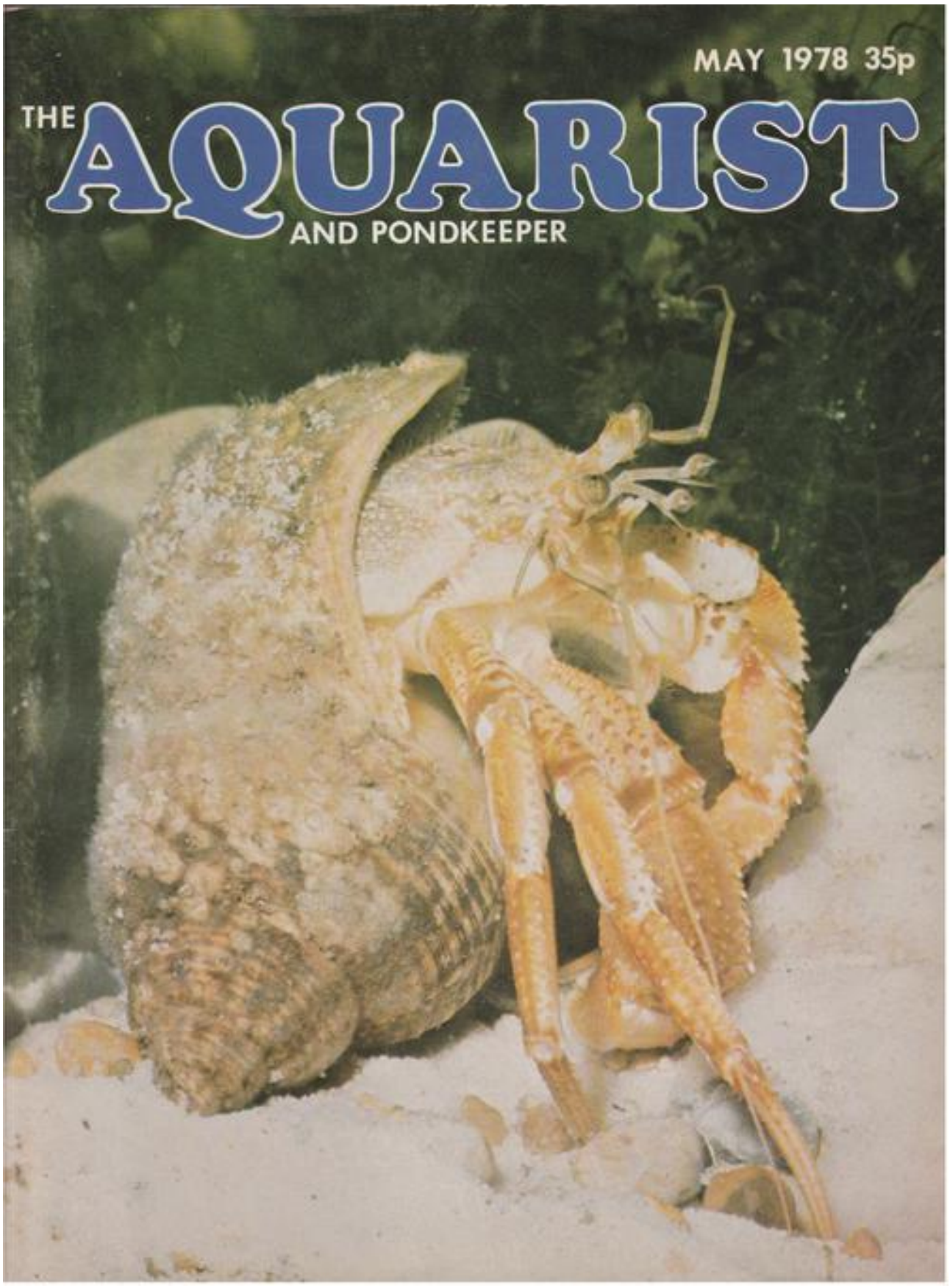
THE AQUARIST AND PONDKEEPER



THE AQUARIST AND PONDKEEPER

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Contents

Tropheus moorei

SOME NOTES ON THE GEOGRAPHICAL VARIATIONS OF THIS *AUFWUCHS* EATER

by Valli Bookless

TO DATE about one third of Lake Tanganjika has been thoroughly researched and so far 21 geographic varieties have been identified. As shown on the chart, *T. moorei* live in rocky areas because they are "Aufwuchs" eaters and the sandy coastline and river mouths which separate the rock outcrops contain none of their natural food.

These fish were actually known at the end of the last century and were first referred to in "Report on the Collection of Fishes made by J. E. S. Moore in Lake Tanganjika during his Expedition 1895-1896." However, no further information emerged until two varieties were found by Poll in 1956 on the south-western side of the Lake. Marlier found another variety in 1959, and Matthes discovered yet another in 1962 at the northern end of the Lake. All the varieties shown on the chart were found up to the end of 1976.

A great deal of information has been collated by Dr. Wolfgang Staeck, which makes very interesting reading. Unfortunately, this and a great deal of other interesting information is not available in English. I find it very frustrating that so little help is given to sincere aquarists who are hungry for relevant information about their adorable pets, and have no way of checking upon their own findings. As I have always had a soft spot for *T. moorei*, I have been thrilled to get together a lot of information about these delightful fish, and I am very happy to share a little of my findings with you by describing all the varieties which I have kept or have read about. The paragraph numbers shown relate to the areas similarly numbered on the chart.

1. *Olive Green variety*. Was discovered near Mwerazi. Is olive green with a yellow stomach. The fins are grey and the dorsal and tail fins have lemon coloured spots. The head has three orange brown lines near the mouth. Youngsters have orange brown stripes across the body. This species is not yet available to aquarists.

2. *Orange var.* (2). Matthes found this variety north of Ubwara in 1962. They are black with a wide red-orange band around the middle. This fish has only recently been imported, and I have been lucky enough to get some beautiful specimens from which I hope that I will be able to breed.

3. *Blue-Black var.* This fish was discovered near Lueba. Matthes described it in 1962, but they have not yet been imported into Europe. In appearance they are blue-black with no other distinguishing marks.

4. *Yellow var.* Details of this fish were published by Marlier in 1959. Unfortunately, they have not yet been imported. They are restricted to a small area close to Kifumbwe Island near Mboko. It is basically black with a quite regular lemon coloured band rising into the dorsal fin.

5. *Orange var.* (1). Found not far from Bamba, it was described by Marlier in 1959. They are basically black, with a wide orange-red band around the stomach which sometimes runs up into the dorsal fin. The depth of colour lengthwise varies. Needless to say, the intensity of the colours depends upon the mood of the fish. This fascinating feature is of course common to all *T. moorei*. A courting, angry or excited fish shows fantastic coloration. In the case of this variety, the colour can be separated by a single black line, or the colour of the stomach can be orange-red, and yellow-orange near the dorsal fin.

6. *Orange-Black var.* Were discovered halfway

between Bamba and Makabola They are basically black, with either orange-yellow spots, or vertical stripes on each side. They have not yet been imported. Described by Matthes in 1962.

7. *Black var.* Marlier established the location of this fish in 1959 between Uvira and Makabola in a twenty kilometre strip along the cosat. They are brown black or black. The iris of the eye is ringed with orange.

1. Olive-Green
2. Orange (2)
3. Blue-Black
4. Yellow
5. Orange (1)
6. Orange-Black
7. Black
8. Yellow-Red
9. Brown
10. Yellow-Green
11. Striped
12. Green
13. Double Spot
14. Forktail
15. Lemon (1)
16. Lemon (2)
17. Rainbow
18. Yellow-Grey
19. Green-Red
20. Black-Red
21. Striped Tail

8. *Yellow-Red var.* These are the most imported. They are black-brown with a yellow-orange triangle continuing upwards into the dorsal fin where it sometimes takes on a reddish hue. Excitement causes a reddish glow to appear on the stomach. The iris of the eye has a red seam. These fish are found on the long coastal region of Burundi, and their identification was first publicised by Marlier in 1959.

9. *Brown var.* (*Tropheus brichardi*). Another variety from the Burundi coast, they are chocolate brown with a yellow area on the body below and between the fourth and the eleventh spine of the dorsal fin. This sometimes extends into the dorsal fin and down to the stomach. Red eggspots can be seen on the anal fin. There is some controversy about this fish which space prevents me from detailing.

10. *Yellow-Green var.* Found by Matthes in 1962 near Nyanza. They have a basic colour of dark brown with a copper-green triangle towards the tail. On the lower sides of the body is a lemon-yellow oval spot fading into grey, and the area from the stomach to the anal fin is connected by a wide grey band.

11. *Striped var.* These fish cover a long area of the Kigoma coastline and were first caught in 1974. The body and fins are brown to olive-green. Between the gill plates and the caudal peduncal are between five and eight vertical stripes. The underside of the body from throat to anal fin is lemon-yellow. The dorsal and anal fin is edged with a thin red line, and the anal fin has orange-red spots. This variety has two co-varieties with marginally different but distinct coloration.

12. *Green var.* (Blue eyed *moorei*). Discovered by Scheuermann in 1975, they came on the market in 1975 in which year I was successful in breeding them. They are found south of the Malagarasideltas up to the mouth of the Lugufu. Their basic colour is brown green and a lemon-yellow band circles the body. The iris of the eye is bright blue. The anal fin can have some orange spots.

13. *Double Spot var.* This fish was first imported in 1976 after having been discovered by Fainzilber in 1975 in the region of Magombo. The body and fins are black with two large spots on the flanks. These spots vary in shape. Sometimes they are long and relatively narrow, and sometimes they are short and wide. The scales of the area of the spot are whitish

colour with a red rim to each. The iris of the eye looks dark, but a closer look reveals a red half rim.

14. *Forktail var.* A very small number of this variety have appeared on the market. The most remarkable feature of this fish is the forked tail. Fainzilber established the existence of this fish on the Tanzanian coast of the Lake in 1976. The body and fins are an olive brownish colour. Between the gills and the tail are light small vertical stripes coloured whitish yellow. These stripes can also appear above the mouth and eyes. The iris of the eye is light blue except for a black mark on the top rim. On the gill plates lies a black spot. On the anal fin are orange spots or lines, whilst the centre of the tail fin can have orange markings. Adult males are plain grey.

15. *Lemon var.* (1). These are found on the south end of the Lake between the borders of Tanzania and Zambia. Just a few have appeared on the market. I had a pair, but unfortunately lost them due to the long journey they had undergone; they just could not recover. The main colour is olive-green. On the lower part of the body between the gills and the anal fin is an elongated spot which is bright lemon yellow. The area around the chin and also the anal fin is red-violet. The gill-plates and the rest of the body have light dots or lines. The dorsal and anal fin can be also red-violet.

16. *Lemon var.* (2). It is considered that this variety is that from which Moore included specimens in his collection of 1895-6 from the area of Mpulungu, and formed the basis of Boulenger's description of *T. moorei*. The body of this fish is olive-green to blackish, whilst along the stomach runs a lemon coloured area. Often this area is concentrated into two or three large spots. The eye iris is light blue except for the top which is black. The dorsal fin is grey to dove blue. No live specimens have yet reached Europe.

17. *Rainbow var.* Are found between Mpulungu and the mouth of the river Lufubu. They were first caught in 1975, and described by Scheuermann and Staeck. The top of the body is olive toned with lighter green. When the fish is excited the stomach turns whitish yellow, the mouth and throat light blue, and the chest and cheeks turn bright red with light blue to greenish dots. The tail and ventral fins are a sooty colour. The anal and dorsal fins of adult fish are shiny blue to red-violet.

18. *Yellow-Grey var.* This is quite a new discovery and little is yet known about this fish. They are found in the southerly part of the Sumbu National Park. In 1975 Scheuermann and Staeck describe this fish as being overall grey-green, the stomach whitish around the head is a pattern of tiny light dots. The dorsal fin is whitish yellow.

19. *Green-Red var.* Discovered between Nkamba Bay and Sumbu Bay and described by Scheuermann and Staeck in 1975. In shock the fish is a vivid green, but normally the back is greenish and the stomach more of a yellow hue. When excited, the dorsal and anal fin turn a bright coppery red.

20. *Black-Red var.* I acquired this fish as a red rainbow variety. It seems to be the wrong name. I have bred it successfully this year, the brood varying between one to fourteen fish. They have not very often been imported. In 1976 two dozen reached Germany, and I have only seen them once again since then. They are found in a very small area north of Ndole Bay. In shock the fish looks entirely reddish. Normally it has a black coating over this colour. Only the dorsal, anal and ventral fins remain reddish. There is a blue line where the anal fin joins the body. Sometimes they have two red bands across the forehead; I have found this more dominant in females.

21. *Tail stripe var.* These are my favourites. I was very lucky in getting them and have been successful in breeding from them. They really are very beautiful fish. Poll described them in 1956 following a Belgian expedition in 1947 returned with one specimen. In Spring 1975, a few examples reached Europe, and again in 1977 when I was lucky enough to get some. They are found between North Zambia and Southern Zaire near Moliro. The head, body and tail are brown-black. Around the mouth, and also the commencement of the anal and pectoral fins, is toned blue. Adult fish have a cherry red horizontal stripe on the rear half of their body, the length of which varies from fish to fish. Sometimes the dorsal and anal fins can be bright red.

To date, these are the total varieties which have been established of *T. moorei*.

In the aquarium I find that *T. moorei* have totally different habits from any other fish from Malawi or Tanganjika. They have quick movements and are constantly tumbling around each other; this is their way. The tank must be set up with plenty of rocks and caves, and the water should be fairly hard. In a standard 5 ft. tank you can safely put in up to fifteen adult fish; beware of adding a new fish to an established tank. Set the tank up and then put in your fish. Trouble generally only happens when two males are interested in the same female; a situation not unknown amongst *Homo sapiens*. The stronger male will chase after the weaker male and follow through by scraping his sides. It is advisable to closely watch your tank when courting is approaching its zenith. However, this does not always happen, and if you evolve a peaceful tank, you have achieved a correct balance and you should not then interfere apart from normal water and cleansing maintenance.

COLDWATER QUERIES

by Arthur Boarder

I intend to make a pond in my greenhouse in which to grow water lily, James Brydon. If I use some bone meal and cow manure can I get it to flower in the first year?

You did not state what size your intended pond would be. You will need one not less than four feet square and eighteen inches deep. James Brydon is one of the finest water lilies for a pond but it needs space to grow well. Whether you could get one to flower in the first year depends mostly on the size of the plant you procure. If it is just a rooted cutting from last year, taken from a side shoot off the root stock, it is doubtful if it will flower. When you get your plant examine the crown and among the small leaf buds, you may see some tiny buds of flowers forming. In such a case it is almost certain that the plant will flower. Do not let the plant get dry before planting. The bone meal and cow manure could make the plant grow strongly, but it is not always the plant which makes the most leaves which flowers the better. Often the opposite is the case.

I am going to make a concrete pond and would like to know what to put in the mixture to make it waterproof?

As long as the concrete is made correctly, there is no need to add anything to the mixture. I made a dozen concerete tanks, 24 × 12 × 9 inches and only half an inch thick, which held water for at least twenty years with the outside remaining dry.

As a top coat to your coarse mixture, make a mixture of three parts washed river grit to one part fresh cement. The sand must be clean and sharp and the cement with no lumps in it. Mix it three times dry and three times wet. Do not make too wet and apply as quickly as possible. Try to do the cover in one go, as if the mixture is left for a hour or so, there may be trouble at the subsequent join. Do not work in frosty weather and if it is warm and dry spray the concrete to prevent too fast a set.

I have a coldwater tank and wonder if some red ramshorn snails would keep the tank clean. Also is it true that if a mussel dies in a tank it will pollute the water?

Red ramshorn snails are usually kept in a tropical tank and are not likely to thrive in your tank. They serve no useful purpose as to keeping a tank clean. Their droppings are as copious as those of small fishes and so tend to pollute the water rather than keep it clean. A dead mussel in a tank would soon become very foul and could pollute the water. A mussel needs a lot of mulm or very soft sand on the bottom of the tank for it to be able to move around.

Can you give me some information on the colour of a good shubunkin? What percentage of the fish should be blue?

A good shubunkin should have a ground colour of a rich blue. There should be red, yellow and black in patches but not enough to cover too much of the blue. I consider that there should be at least a third of the body blue. The red should be a good bright colour and where the colours meet there may be a little brown or mauve. Neither the red or black should be more prominent.

I live in an old property and beneath the dining room is a well, 14 ft. × 10 ft. with a depth of four feet. The water is very clear and I would like to know if I can use it for rearing Trout.

This is a strange place to find a well and I am wondering how you would be able to get to it. However, it is not likely to get much light and so you would have to have sufficient light available for at least twelve hours a day. As for keeping Trout in it, I do not think that this would be possible. These fish are among the hardest coldwater fishes to keep in a small pond. They need plenty of well oxygenated water and without it they would soon die. Providing you can supply some light you might be able to keep Tench and Carp in your pond, but how you would be able to get to them for feeding etc., I just cannot imagine. I have visions of you shifting the dining table and opening up a trap-door in the floor and then descending into the depths.

When my pond thawed out after being frozen over for a few days, I found four goldfish dead. Do you think it was the cold which killed them?

I do not think that the cold alone killed your fish. I expect that the water became foul and so poisoned them. If the pond had not been cleaned out last late autumn, there would have been a quantity of decaying matter on the bottom. This gives off foul gases which would be trapped under the ice and so the fish could not get sufficient oxygen. When a pond freezes over it is well to thaw a hole by standing a water-can of boiling water on the ice. Keep this open and if frosts continue remove a little water from the pond so that the surface is free from the ice cover. This will allow any foul gases to escape. Lay a sack over the hole at night if frost is expected. This

should stop the water under the ice from freezing again. Remove most, if not all, of the water once the ice has thawed, as it is probably foul. Fill up with fresh and all should be well.

Would a Bristol shubunkin remain healthy in my garden pond throughout the winter?

I do not advise you to try this as I consider that you are too near the East coast and so could get very severe frosts in the winter. The Bristol type of shubunkin has flowing finnage which could be prone to attacks of finrot and congestion when the water gets very cold. You would probably be safer with a London type which is shaped like the common goldfish but should have the same colouring as the Bristol type. As this fish has a shorter finnage it can stand extremes of cold which could harm a fish with longer and more delicate fins.

I have found some leeches on my pond fishes and wonder if you can tell me how they could have got in the pond as I have not added any fishes or plants for some time?

It is difficult to state how the leeches got into your pond. They could have been introduced as tiny ones or as eggs with live food such as *Daphnia* or *Tubifex*. If none had been given, then eggs could have been brought in on the legs of water birds or even frogs which had come from a pond. It is fairly certain that they came in on something wet. They are difficult to clear from a pond the size of yours. Your should catch the fishes and remove all leeches seen. You can trap them by placing pieces of slate or tiles on the bottom. Examine each morning and leeches may be found underneath. You can make a trap with a screw-top jar with a funnel in it. Place a piece of raw meat or some garden worms inside and lower into the pond on string. If you examine each morning, you should be able to catch many.

My neighbour had four goldfish in a tank of tropical fishes. She foolishly cleaned the tank out and used a metal polish to clean the glass. All the tropicals died and she gave me the goldfish. I put them in a spare pond and added a heater. When will it be safe to put the goldfish in my other pond without a heater?

You should wait for a mild day and then move the fish in the late afternoon. You could test the temperature of both ponds and if there is little difference the fish should be all right.

I intend to make an all-glass tank. How are the ends, sides and base fitted please?

The usual method is to have the ends fit inside the front and back and then the whole to sit on the base. See that all joints are cleanly cut and you can use one of the sealants as advertised in 'The Aquarist.' You need only have clear glass for the front. All the rest can be wired or opaque glass as long as it is of sufficient thickness to stand the weight of water. Quarter plate should suit your purpose.

How often should goldfish be fed during the winter? I have read many conflicting ideas and am bewildered.

It is not possible to give any stated time or frequency of feeding. The temperature of the water is the main consideration. Goldfish in an outdoor pond could go right through the winter without having to be artificially fed. On the other hand any goldfish kept in tanks in a house, might need a little food every day. Once water gets cold the actions of the fish will slow down considerably and they become very sluggish and although they do not become completely dormant, they move very little, require less oxygen and food. Regarding the pond fish, if they have been fed well during the past summer and autumn, they could go right through the winter without needing any extra food. I state extra, as there should always be a certain amount of food to be found in any well run pond during all times of the year.

Even if there are no small water creatures for the fish to find, there is sure to be some soft vegetation among the water plants on which the fish can feed. However, during most winters there is a spell or two when the weather can become quite mild, and at such times the fish may be seen to move around more. A little food can then be given but I do not advise any dried foods, but garden worms are the safest. Trouble can soon arise if dried foods are given and not eaten fairly quickly. The uneaten food can then tend to pollute the water and if the pond freezes over added danger can ensue.

For fish kept in a tank in a living room the question of feeding is quite different. Whilst the temperature of the water in a pond can be about 40° F., that in an indoor tank can be as much as 65° F., or more. This is especially the case when an overhead lamp is kept on for some hours. There may not be much difference in the winter temperature to that of the summer. In such cases the fish may be fed right through the winter almost the same as during the summer. Once a day should be enough and before the regular feed, a very little should be offered and if this is not taken almost immediately, no more should be given that day. Some aquarists are of the opinion that fish must be fed every day or they would die. Such is not the case as a goldfish can go for weeks without being artificially fed. Most water will contain some fine forms of *infusoria* and when one realises that a fish must take a certain amount of water into its mouth to breathe, it is obvious that any fine live, or even vegetable, food in the water could be screened out by the fish.

MARINE QUERIES

by Graham F. Cox

READERS' SERVICE
All queries MUST be accompanied by a stamped addressed envelope.

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

I would like your advice on the following:—

I have a 4 ft. tank fitted into the wall (angle iron) to remove same would be difficult, I wish to convert to marine (salt). At present the inside seams are sealed with HYKO black sealer, if I scrape this off and reseal with DOW CORNING would this be enough?

The top angle has rubber stuck from the glass over to the angle.

The other way I have thought about is to stick plastic angle on the seams and seal with DOW CORNING. Do you know of a adhesive to do this or would DOW CORNING do the tob. The corner jams could be sealed with DOW.

The tank is heavy angle iron, glass put in with normal tank putty.

In fact *iron* is the only metal I know of (apart from a good FMB grade STAINLESS STEEL) which is non-toxic to marine-life. Thus the objection to the usage of angle-iron framed aquaria for marine systems is based not on the risk of poisoning the coralfishes and invertebrates (because this risk is non-existent as explained above), but on the aesthetic objections raised by corroding iron frames producing unsightly brown stains.

The best way of making your aquarium safe is as follows:—

(1) Clean *all* the interior angles of the tank thoroughly to bare glass, with a final wipe-off using acetone or C.T.C. (= THAWPIT) but *NOT* methylated spirit. Now, silicone-rubber seal the internal angles according to the instructions on the package.

(2) Clean down to bare iron the *top-frame* of the tank, just wire-brushing loose scale off the remainder and give the following paint treatment:—

Coat 1—metal primer paint.

Coat 2—non-lead undercoat.

Coats 3 & 4—non-lead gloss-paint.

(3) Finally using a thixotropic contact adhesive (e.g. "THIXOFIX") glue strips of thin plastic (e.g. LACONITE, FORMICA, PERSPEX) all over the top-frame so as to completely envelope it in plastic.

Your aquarium is now ideal for use as a sea aquarium.

I am moving in May of this year to a brand new house and my problem is I have a 52 in. × 12 in × 15 in. marine aquarium in perfect condition containing:—

2. Electric-blue Damsels
1. Yellow longnose Butterfly
1. Queen angel
1. Pearl Butterfly
1. Chocolate Clown
1. Domino Damsel

I have at my disposal a 24 in. × 12 in. × 15 in. × 15 in. all glass aquarium, air pump, heater and thermostat.

I would be grateful for any advice and information regarding moving my marine aquarium. The distance I am moving is approx. 18 miles.

Method A. Where a spare aquarium is available.

After you have exchanged contracts on your new house, the vendor's solicitors can usually authorise you (through your own solicitors) to gain entry to the new house 48 hours before completion is due. You should use these 48 hours to set-up your reserve 24 in. × 12 in. × 15 in. aquarium, complete with U/G filtration heating etc., in your new house, and remembering to add a pint or so of fully-matured coral-sand from your established tank to this new filter-bed, once the newly-dissolved seawater has chemically-matured by aeration/filtration. This chemical maturation of newly-prepared synthetic

Continued on page 58

KOI QUERIES

by Hilda Allen

I am at present building my first garden pond and hope eventually to have Koi. The pond will be 12 feet by 7 feet by 3 feet deep and the pond liner will be of Ethylene Propylene. I would like to know the sort of filter system I will need and I would like to add a waterfall. Also, how many Koi will my pond hold?

In the first place I would recommend you to make part of your pond around 4 feet deep, the remainder need only be 2 feet deep so the amount of "digging-out" should be about the same. Ponds of different depths, or made with sloping floors are a good idea; it is certainly not necessary to have floors that are perfectly level. Needless to say (again) that Koi appreciate the protection of deep water during winter but will be nearer the surface during summer because it is warmer there. I would suggest that you make an under-gravel filter to go in the shallower part of your pond. U/g filters should never be in the deeper areas as they collect too much mulm etc. there. The gravel can be contained, either by edging or kerb-stones or within a depression. As your pond will be approximately 84 sq. ft. in area then your filter should be about 24-28 sq. feet. So, one measuring 7 ft. × 4 ft. (to fit the width of your pond) would be ideal. The return from the pump can be taken (via ¾-1 inch hose) to a waterfall which should be situated over the deep area.

I would advise a maximum of twelve 6 in.-8 in. Koi for your pond-size. There is no point in over-stocking; Koi certainly need more space than other pond-fish such as goldfish etc. and overcrowding inevitably leads to problems.

Can you tell me if the charcoal briquettes as used for barbecues would be suitable for using in my filter? The cost of the aquarium type of charcoal, which has to be changed, is too high for regular use in a pond-filter.

I have no knowledge of the charcoal briquettes you mention but I would be suspicious of the bonding agent used, which may or may not be toxic to fish. If there is the slightest doubt about any material it must be avoided. It is usually too late when any toxicity is discovered so, "if in doubt, leave it out" is a good motto. Broken or half-bricks or large stones make a good base for an outside filter. In any case, by the same token that aquarium charcoal has only a limited useful life, I cannot see that other forms should be expected to purify water indefinitely. With normal stocking rates of fish plus an adequate filter system the use of charcoal as a water purifyer should not be necessary for ponds.

I have two indoor aquariums, one is 24 in. × 12 in. × 12 in. and the other is 36 in. × 15 in. × 15 in. both holding a total of 12 fish, including 4 Koi. I realise that I have too many fish but can you advise me as to how I can keep the water clean instead of cloudy, I already have filtration. I feed the fish on pellets, peas, worms etc. but after about a week to ten days after cleaning, the water is very cloudy and murky and I would so like to see my Koi in clean water; they will go outside later on.

As you already realise that you have too many fish for your tank space then you must do two things. Assuming that it is not possible to provide more space (and few people are willing to part with good fish) then it is vital that you change water at more frequent intervals, and possibly reduce the feeding.

The tanks should be siphoned—out at least once every four or five days and the water replaced by some that has stood overnight. Outside filters should be cleaned at the same time and the amount of food given should be reduced. At this time of year Koi kept in tanks are growing and the problems are greater than at any other time. It is always unwise to over-stock but it is essential that at least they are kept in reasonably clean conditions until they can go outside. This inevitably means more water—changing otherwise there is the risk of pollution and poisoning which could lead to you losing fish.

I am considering turning a disused swimming pool into a large Koi pond and I would appreciate some advice up on which is the best sort of Koi to buy. Information upon varieties, sexing, prices etc. would be most welcome.

I hope you will make sure that your swimming pool is clean and contains nothing that could be toxic to fish before you consider buying Koi. To me, the best sort of Koi will always be the healthy ones regardless of variety, colour etc as living fish provide more pleasure than dead ones; however, one must always be prepared to accept some losses, especially in the beginning. There is an enormous number of different varieties of Koi in most colours, matt or metallic and with varying types of scales; the choice is endless and no two Koi are the same. Sexing Koi, especially young ones, is not easy. Generally, females have a more rounded appearance than males

which should have a smooth, slimmer outline. During the breeding season it is easier to sex mature Koi; as the eggs develop in the females there is a visible thickening of the ventral region, as with goldfish. It is impossible for me to elaborate on prices as much depends upon size, quality etc. If you intend to keep Koi for pleasure I would suggest you buy a greater number of smaller ones than a few large ones. Koi from 6 in.-8 in. or 8 in.10 in. grow quickly in large volumes of water and number should provide you with Koi of both sexes. Adult Koi, from 16 in.-22 in., can easily cost £100 each with good quality ones costing far more today. Air-freight charges are an important factor contributing to the price of larger, imported Koi as they cannot be overcrowded and require an extra weight of water.

Having kept eight small Koi indoors throughout the winter I would like to know when they can be moved to my outside pond in safety. Also, will it be necessary to protect them from my larger Koi?

Probably May will be the earliest month for safely transferring your small Koi but much will depend upon temperature. When kept indoors Koi usually enjoy temperatures between 60°-65° F (without extra heat supplied) and few ponds may reach these levels by May. The best time is towards evening on a warm day, and the Koi should be moved in a polythene bag which should be floated in the pond for up to one hour to allow the warmer water time to cool off slowly. Sudden changes in temperature must always be avoided. After an hour or so it is advisable to add some pond water to that in the bag in order to make the transition more acceptable by regularising the different condition, pH etc. of both waters.

All the above takes time but the effort is very worthwhile. Consideration and common sense pay greater dividends than causing fish unnecessary stress. You will not need to protect your small Koi from the larger specimens. Carp are peaceful, mild fish, they are not territorial and do not bully other fish even though there may be wide differences in sizes.

As I am only able to make a pond measuring no more than about 8 feet by 7 feet would you consider this large enough for Koi?

Your pond would not be really adequate for Koi and I believe you would get more pleasure from keeping goldfish and shubunkins. Koi need far more space than goldfish with plenty of growing room if they are to grow to their normal size. Koi are at their best when allowed to reach their full potential and I am not in agreement with confining Koi in small ponds. It is true that small Koi are kept in small ponds but I believe that the less active goldfish are more suitable. Koi will not grow into large specimens if they are deprived of space and it is most unwise to buy large Koi for small ponds.

Young specimen of *Pterois volitans*

FIREFISHES

by Bob Purdy

CORAL FISHES, from the tropical oceans of the world, are amongst the most beautiful and bizarre creatures ever to evolve either in or out of water. More often than not, the principle features of these fishes are the colours and patterns that they sport and these features have made the coral fishes more than desirable as aquarium inmates. For those aquarists whose tastes tend a little more towards the bizarre end of the spectrum, the members of the genera *Pterois* and *Dendrochirus* will be found to be an even more attractive proposition than most. The various species combine high quality colours and patterns with extremely exaggerated and unusual fin shapes; the whole gives a mixture of colour and grace that has to be seen to be believed.

Fishes that belong to the genus *Pterois* have been

blessed with quite a number of different common names. Turkey Fish, Lion Fish, Scorpion Fish, and Dragon Fish are some that have been used by aquarists in this country. Firefishes is a name that is used more by European aquarists to describe the members of this genus but it is a so much more flamboyant and descriptive name that it will be used in preference to the less descriptive names listed above. The name Firefishes is also used to describe the members of the genus *Dendrochirus*, somewhat smaller but similar specimens to the *Pterois* species.

Pterois volitans is the species most commonly on offer in this country. This species, known as the "Red Firefish," is to be found in the Red Sea, the coastal waters of East Africa as far south as the Cape of Good Hope and many areas of the Pacific Ocean. Specimens will often grow up to a foot in length in the wild state but specimens of three to five inches are most likely to be captured and sold as aquarium pets. *Pterois volitans* shows the normally exaggerated dorsal and pectoral fin shapes associated with members of this genus and is distinguished from other members of the genus by the very pronounced fringes located above each eye. The body is crossed by many vertical stripes of light orange and dark brown and this pattern is continued into the elongated and separated fin rays of the pectoral, dorsal, anal and caudal fins. Red Firefishes are not at all shy, fear no predators, and soon settle down to aquarium life after being taken from the wild.

Pterois antennata is sometimes offered under various names and is very similar in appearance to *P. volitans*. It can be distinguished from the Red Firefish by using the following criteria:—it has a very short fringe above each eye and the front fin rays of the pectoral fins are turned upwards. Its usual habitat is the coastal waters of the Pacific and Indian Oceans and it has a body shape and size comparative to those of *P. volitans*.

Pterois lunulatus is very rarely seen in the aquarium and, although it has a similar geographical distribution to that of *P. volitans* it is far less common and much more retiring than that species. Although the basic body shape of *P. lunulatus* is normal for a member of the genus, the separated fin rays in the dorsal and pectoral fins are shorter and thicker than those of the two previous species. The ground colour of both dorsal and pectoral fins is more pink than orange and although the body pattern remains very similar to that found in *P. volitans*, the ground colours on the body are a lighter shade of brown and pink. There are usually a number of "eye" marks carried on the pectoral fin rays in more mature specimens and body lengths of up to twelve inches have been recorded for wild caught specimens.

Pterois radiata is a very rare but much sought after species of the genus. The fin rays of the pectorals are extremely elongated, more delicate and much finer than in the previous species. Body colouring is a dark brown with thin white stripes forming similar patterns to those found in other species, the basic body shape is typical of the genus as a whole. Not too much is known about this species but it would appear to inhabit similar environments to those inhabited by *P. volitans*. Ten inches seems to be the maximum recorded body length for wild caught specimens.

Pterois miles is another rare and much sought species of this genus. The most striking feature of this species is a thin continuous membrane that joins all the fin rays of the pectoral fins giving the fish a rather bat-like appearance. The background body colouring is a rich pink-brown traversed by whitish stripes to form a much courser pattern than that found in other *Pterois* species. This species is very rarely found in captivity and the author has only ever seen one living specimen this being some eight to nine inches long at the time.

Members of the genus *Dendrochirus* are often known as "Zebra Firefish" and are smaller and less well patterned than typical *Pterois* species. They inhabit large areas of the coastal waters of the Indian and Pacific Oceans but are rarely caught and imported into this country. In most species of *Dendrochirus* the pectoral fin rays are joined together by a striped membrane, the dorsal fin rays are short and quite stubby and the overall body length rarely exceeds seven inches.

Both *Pterois* and *Dendrochirus* species belong to the family Scorpaenidae and are closely related to the notorious Stone Fishes, *Synanceja horrida* and *Synanceja verrucosa*. All members of the genera *Pterois* and *Dendrochirus* are venomous fishes and should be handled with great care (in other words not handled). It would appear that some accounts of stings received from Stone Fish are often exaggerated and that, although great agony is produced by such a sting, it is not as fatal as it is sometimes made out to be. Firefishes are less venomous than Stone Fishes and are generally quite safe to keep as aquarium inmates. The poisons found in some *Pterois* species are said to resemble cobra venom and to be treatable by using serum intended as an antidote to cobra bites. From personal experience it can be said that the sting from a young *Pterois volitans* of about four inches in length, is sufficient to cause pain similar to that sustained from a bee sting. The resulting swelling is not too uncomfortable and should vanish after about twenty four hours. It is more than possible that a fully grown Red Firefish of twelve inches or so would cause far greater problems than those previously described but it appears unlikely that the sting of any of these species would actually and directly cause a human death. The venom is carried in the fin rays of the dorsal and pectoral fins and

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Mystery Labeotropheus Species

by Richard A. Dunleavy

I FIRST came across this lovely fish about two years ago whilst paying a rare visit to one of the many excellent aquarist shops south of the border; they were on sale as *Labeotropheus trewavasae*, but even at their small size, aproximately five centimetres, they did not look like any trewavasae I had ever seen; the colour and shape were all wrong.

For anyone not familiar with the *Labeotropheus* genus the following may be of some help. The genus was first described by Ahl in 1927 when he mistakenly named two species, *Labeotropeus fuelleborni* and *L. curvirostris*. His observations were based on the shape of the nose. After examination of the preserved specimens some eight years later by Doctor Ethelwynn Trewavas, it was found that the differences were too small for two species to be recognised. Later investigation by Fryer some twenty years on, proved that this was the correct decision as there can be large variations in head shape between individual fish.

The genus is easily recognised by the large nose and downward pointing mouth which is as wide as the head. The angle of the body to the substrate when the fish are feeding is a good indication their age as young fish stand at almost right angles to the substrate, while older fish feed at a more acute angle.

When Fryer undertook his investigations at Lake Malawi, only one species was known, but over the years a number of individual "Fuelleborni"(?) had been observed which appeared to have a much slimmer body than the others, but nobody followed this up. Eventualy laboratory investigatios of preserved specimens showed that there were two closely related species, *L. fuelleborni* and the slimmer species which was named *L. trewavasae*, (after Dr. Trewavas). There are several differences between the two species: in the scale count along the lateral line and in the hard rays of the dorsal, but the most obvious difference is in the depth of body of fish of the same length. Standard length (which excludes the tail) divided by body depth gives the best measure of the difference; if the answer lies between 2·54 and 2·94, the fish is *L. fuelleborni*, if it lies between 3·13 and 3·64, it is *L. trewavasae*, Fuelleborni males come in a variety of colours; the most common type has a blue body with eight to ten distinct vertical bars and a blue dorsal shading to red towards the caudal; the ventrals are reddish brown with a black stripe and a light blue leading edge; the anal is also reddish brown with one or more egg spots. When the male is in breeding dress an area on the head extending from the mouth to behind the eye becomes black, with two bright blue stripes between and above the eyes. The first of the vertical body stripes becomes almost black while the remainder become pale or fade completely into the bright blue background.

There is also a red top male which is the same basic colour but it has an orange or red dorsal, a black top male which has a wide black stripe on the dorsal, and a sky blue male which has no other colours at all. I have also owned a pair of orange *L. fuelleborni*(?), but when I lost the so-called male and ordered another one I was presented with a sky blue male and assured that this was the right male, so what was the one that died? The blue male killed the orange female and then died a few days later. Unfortunately I have never come across any more orange *L. fuelleborni* since.

There are two colour types of female, the most common being grey blue with a brownish sheen, the other being the orange blotch female which has brown, black or orange irregular spots on a muddy white or orange background. The majority of *Labeotropheus trewavasae* males are of a fairly standard colour, consisting of a bright blue background with six to eight mostly indistinct dark vertical bars. The dorsal is orange or red and the anal is also red or orange on the front half, shading to bright blue towards the caudal with two or three bright yellow egg-spots. The ventrals are also red/orange with a light blue leading edge; the caudal fin is bright blue with darker rays and a reddish border. Females are virtually identical in colour to the female fuelleborni.

My own fish, however, bear no resemblance in colour or shape to the aforementioned fish. The female has a light brown background colour with orange and blue speckles. The male is reddish brown

above the lateral line, becoming light blue below this line; the dorsal is the same colour as the upper body at its base, but becomes light blue towards the upper edge; the ventrals are light blue with a dark stripe and white leading edge; the caudal has light blue rays on a brownish background with an orange border at the rear; the anal is light blue with large dark ringed egg spots. When in breeding dress the lower half of the body becomes almost purple, and the upper portion becomes virtualy brick-red shading to a brilliant blue towards the upper edge of the dorsal; all other fin colours become really intensified and the egg-spots seem to glow.

My first spawning of this species ocurred approximately six months after I purchased them; in this time the male had grown to approximately ten centimetres and the female to eight. They were housed in a 36 in. × 15 in. × 12 in. tank in my living room where I had put them so that I could keep an eye on them in the hope that if they spawned I might get a chance to observe them. They were put on my usual feeding regime to bring them in to breeding condition, i.e.—beef heart, chopped earth worms, raw fish, and liver as well as the usual flake food. The water conditions were as follows: temperature, 27 C. P.H.8·5, and 18 dgh. The tank was furnished with numerous pieces of rock and slates aranged along the back and sides to form caves, and contained my pair of *Labeotropheus* species, one pair of *P. zebra* (Red morph), one pair of *P. livingstoni*, and one plecostomas cat fish. I spent quite a lot of time observing my pair but nothing seemed to be happening, in fact the male seemed to be more interested in chasing and displaying to the plecostomus than he was to the female. Eventualy, however, he began to pay attention to her but she immediately disappeared behind the rockwork. This went on for several days, and then the female began to return the male's interest. She began to change colour to an almost chocolate brown with the orange and blue spots becoming quite brilliant. The male then began to display to the female and this is a sight worth watching. With all fins fully extended and his body slightly curved, he began to shimmy and shake in front of her, and at the same time he seemed to glide backwards and forwards a few inches. The female stayed perfectly still while this display was going on but then she seemed to lose interest and would attempt to get away, but whichever way she turned the male would cut her off and continue his display. She would then eventually approach him and they would stand head to tail for a few seconds and then start to swim in circles as if chasing each other's tails. This always started off slowly increasing in pace until they became almost a blur. At this point the female would break away and dart in behind the rocks where she would remain for anything up to fifteen minutes. She would then reappear and the whole process would start all over again. I watched this performance for two hours on and off but it never seemed to lead anywhere and as it was getting late I put the lights off and went to bed. Next evening when feeding the fish I noticed that the male's colours were more subdued and the female was conspicuous by her absence. I checked the tank several times that evening and on the following day but she never appeared. In fact, it was the third day before I saw her. As I dropped some flake food into the tank she came out from under a rock in the corner of the tank and went straight for the food, but to my relief she did not touch any of it which meant there was a chance she was carrying eggs in her mouth. I had a good look at her before she returned to her hiding place but I could see no definite signs that she was carrying eggs. This, however, is quite common with the *Labeotropheus* genus due to the size and shape of the downward pointing mouth.

Approximately one week after the now confirmed spawning the female began to appear at feeding times and very carefully suck a few flakes into her mouth without actually opening it. At this time I was working rather long hours at the hospital where I am employed and I just did not feel like transferring the other fish in the tank down to my fish house so I put a dividing glass into the tank giving my female approximately one third of the tank including her hiding place, of course. I have used this method on numerous occasions and it was always successful, but I had always used an opaque piece of plastic. This time I used a piece of clear glass. However, eighteen days later I checked the tank in the morning before going to work and saw that the female had released her fry. I counted nine and they were a good size so I immediately dropped some flake food in for the female and some brine shrimp for the fry and went to work. However, on returning that evening the fry had gone. I checked the partition for any gaps but there was no way the fry could have got through into the other side so the female must have eaten them. I have never had this experience before so the only conclusion I can come to is that the female seeing the fish on the other side of the partition felt that the fry were threatened and she ate them herself.

My next spawning occurred some six weeks later and I removed the fry as soon as they were released. There were eleven of them and they were approximately 1·75 centimentres long and very dark in colour with a terminal mouth. The fry do not develop the large nose and downward pointing mouth until they are five or six centimetres long. The adult colouration also begins to develop at this time. My last few spawnings of this species have been lost due to my inability to spend as much time with fish as I should but things have now improved and at the time of writing my pair have spawned again and I hope to have more success with this spawing.

FIREFISHES

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seems to be a purely defensive mechanism, never actually used in a conscious way.

Firefishes can be kept in any normal kind of marine set-up and tend to be more hardy and tolerant than most other marine species. It is probably better to keep *Pterois* species away from other marine specimens although the author experienced no problems when a *P. volitans* was kept together with two Tomato Clowns of approximately the same size as itself. Firefishes can be kept in groups and often make a splendid sight when four or five specimens are housed together in one tank. There seems to be no possible way of sexing live specimens and no records of breeding have been published to date.

The members of both genera are carnivorous by nature and will eat most living creatures that they can fit into their mouths. Home bred Guppies provide a ready source of live food that is convenient and cheap and providing they are bred and raised in brackish water they will live quite happily when transferred to the marine aquarium This is an important point because, should the Firefish fail to eat when the Guppy is added, the Guppy will not die and pollute the water of the aquarium. Feeding strips of meat is difficult and tedious and if it should become necessary to do so the meat should be tied to a length of white cotton and pulled around the tank. *Pterois* species are predators and will only take food that appears to be alive and swimming hence the reason for keeping the meat strip on the move. Anything that falls vertically through the water is totally ignored. Although Firefishes are reasonably tolerant of nitrite levels it is bad practice to allow meat strips or dead Guppies to rot in a marine set-up; these should be removed (with care of course) as soon as they are spotted.

Any aquarist who has observed a Firefish making a meal of a Guppy will know that these fish can move far faster than their normal, sedate appearance would suggest. Couple this with the fact that most *Pterois* species are very inquisitive and quite tame and you have a very good reason for keeping fingers and hands out of their tank.

Providing a few basic rules are observed, Firefishes can be kept as safely as any other species of marine life and even when the rules are broken the results are not as horrific as we are sometimes led to believe. All *Pterois* species can be recommended to the beginner without reservation as they are quite hardy and can usually survive those few, inevitable mistakes that seem to accompany every first effort to set up a marine tank.

MARINE QUERIES

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seawater is complete after about 24 hours of aeration and filtration.

You should then pack your coralfishes in the largest polythene bags available, with just enough seawater to cover the fish, but trapping as much air as possible before tying off the top of the bag with elastic bands. **Do not inflate the bags by blowing into them!**

Now drive the fishes to your new house and set them free after the normal acclimatisation programme as though you had just bought new fishes.

Now move over your large show tank to the new house, reassemble it and re-introduce the fishes at your leisure. The smaller tank (i.e. 24 in. × 12 in. × 15 in. all-glass) should now be kept going since it will give admirable service as a quarantine/hospital tank.

Method B. Where a reserve tank is not available.

(1) Catch all the fishes and, as explained above, pack them one to a bag in the minimum possible water to cover them and with the maximum possible trapped air. Now put all the bags of fish into a styrofoam box (borrowed or hired from a friendly trader) and tape down the lids of the boxes so that the fishes are in total darkness. Once packed in total darkness in this way the respiratory rate falls quickly to 20-30 gill-beats per minute and the oxygen (which makes up about 20% of the air you've trapped in the polythene bags) will now last for up to 8 hours. **Don't forget to keep the boxes warm.**

Now siphon off all the water from the established aquarium into large polythene bags and supporting them in stout cardboard boxes move the tank, stand, hood, accessories, water and fishes over to the new house as quickly as possible. Re-assemble the aquarium and introduce the fishes back into the aquarium once the water temperature in your tank is back up to 76-78°F.

NB: You can always quickly warm up chilled seawater by adding a kettleful of boiling water to the seawater whilst it is still in the polythene bags. **Do not add this hot tapwater to the seawater once it is in the aquarium. You will almost certainly crack the glass!**

Finally, when moving fishes in this way, I always carry out two (2) consecutive days treatment with "Cuprazin" (no invertebrates) or "Myxazin" as a prophylactic measure.

AQUATIC CHEMYSTERY (2)

by Dr. P. A. Lewis

HAVING taken the trouble to read my preceding article the reader may still be in doubt as to what effect pH has on the wellbeing of his fish. From the viewpoint of an aquarist the following concepts should be evaluated. In contrast to a Marine environment, the chemical characteristics of inland waterways are extremely variable and fish have succeeded in populating almost all these varied bodies of water. Therefore, fish imported from the far corners of the earth have adapted to the environmental conditions of their home waters and ideally the aquarist should take note of these conditions when keeping such imported fish in their home aquarium and attempt to duplicate these conditions as closely as possible. To illustrate my point let us compare the analysis of waters from the mighty Amazon river with that of water from Lake Tanganyka, as given below:—

	Lake Tanganyka	River Amazon
pH	8·5—9·0	6·5—7·1
Calcium	25—35ppm	10—25ppm
Magnesium ..	25—30ppm	2—5ppm
Silica	8—10ppm	7—9ppm
Dissolved Solids ..	40—45ppm	25—50ppm
Total Hardness ..	160—190ppm	10—30ppm

To rationalise the concept of keeping exotic tropical fish in a home aquarium it can be stated, with some degree of confidence, that the majority of freshwater fish imported into Britain can be successfully kept in an aquarium containing a variety of well-established plants, growing on a gravel substrate which may or may not contain some type of growth promoter, provisions having been made for providing suitable hiding places for the shy and reclusive fish by the inclusion of inert rocks (Welsh slate or Cumberland granite are ideal and pleasing) and waterlogged or petrified wood arranged to suit the aspirations of the aquarium owner. Ideally the water should be slightly acid (pH 6·7 to 6·8) to neutral with a hardness in the range 80 to 200ppm. As a rule the temperature can and will fluctuate over as much as 5°F. What is most important is to plan the occupancy of the tank with due reference to the compatibility of the fish contained therein. We all know that Oscars and Neons don't mix, so why try?

In the case of breeding fishes my views change slightly in that the egg development of many species of fish is far closer linked to the environmental conditions than many of us realise. The fish breeder must understand that fertilisation of the female ovum occurs in the tank water and that factors such as water hardness, pH and dissolved substances, eg., Tannins, play an important part in the future development of the egg. The main factor which dominates the sperm's ability to fertilise the egg is pH. Optimum activity of the male sperm occurs in a very narrow range lying from around pH 5·8 to pH 7·2 dependant upon the species concerned. If attempted fertilisation occurs at a pH which is not optimum for the species concerned then the percentage of unfertilised eggs which will subsequently fungus over will be high. This may not concern the aquarist who is solely interested in breeding the species and is not concerned with the yield of fry as compared with the efforts expended. However, a further complication can arise in that the male/female ratio of the young may vary with slight changes in the pH. Goldstein, in his book "Cichlid Handbook" cites the breeding of the *Apistogramma* species of dwarf cichlid as responding to a change in pH from slightly acid to just alkaline in order to alter the male/female ratio of the progeny.

To understand the above postulates let us examine in fuller detail what happens during the spawning of egglayers. The ova of a fish are surrounded by a thin protective membrane which is altered chemically by the action of dissolved substances in the water into which the ova are expelled. On fertilisation of the ovum by penetration of this membrane by the male sperm a membrane known as the fertilisation membrane forms at the surface of the ovum. This membrane's primary duty is to protect the now fertilised ovum or egg from the entry of further sperms. Suppose in nature this all takes place in an environment very low in calcium content and the eggs have evolved to develop in such an environment (i.e. Calcifugous eggs), further let us suppose that the aquarist attempts to spawn our hypothetical species in waters rich in calcium (i.e. hard water). It is a

well-documented fact that the calcium ion has the potential to precipitate colloidal albumin derived compounds and it may be this that results in rupture of the eggs or incomplete formation of the fertilisation membrane leading to poor results when breeding our fish which lays Calcifugous eggs. Equally well the high calcium content may also effect the behaviour and viability of the male sperms.

The developing egg is continually exchanging substances between the inner part of the egg and the semi-permeable fertilisation membrane with the surrounding aquatic environment. This process is termed Osmosis and occurs throughout nature as a necessary and vital function of the living cell. It is as a result of a disturbance of its Osmotic balance that a garden slug dies through dehydration when salt is poured onto its tail. Damage caused by a high calcium ion content may be as a direct result of blocking or prevention of such Osmotic exchanges.

pH also plays its part in the development of eggs as exemplified by the case of the Harlequin. When examining the percentage of normally developed eggs of the Harlequin fish, hatched under varied conditions it was noted that: "The percentage of eggs showing normal development was almost identical provided that the water was hard when the pH was low and conversely that the water was soft when the pH was high." The actual results were as follows:—

pH	Hardness (ppm)	Percentage normally developing eggs
7·0	36—45	95
6·5	54—72	92
6·0	90—108	97

As discussed in my previous article, waters which have been made acidic by the introduction of peat extracts will contain varying amounts of tannins and humic acids. These substances have been shown to have the ability to interfere with the reproductive cycle of bacteria (i.e. they are Bacteriostats) and thus may prevent excessive bacterial growth. The surface of an egg is always threatened by bacterial settlement. It therefore follows that the bacteriostatic action of tannins introduced into the breeding aquarium is possibly an asset towards the successful breeding of such fish as Discus, Cardinals, Killifish, etc., which inhabit naturally acidic waters. A further factor that arises from breeding fish in "peaty" water is that the water may be coloured deep brown by the peat extract. This has the effect of diffusing the light which enters the aquarium thus aiding in the development of "light sensitive" eggs of fish such as the Cardinal and Neon tetras. When I lived in Bristol people never tired of relating the story to me of a local tetra breeder who used to use tea leaves (once used) as a substrate in his tank where he used to breed Cardinal tetras. Tea leaves are, of course, rich in tannins and there appears to be no reason for not experimenting with tea leaf extracts to replace peat extracts in a breeding set up. Imagine the arguments which would then follow as to which blend to use!

During this article I have mentioned water hardness on more than one occasion and it is my intention to discuss further the cause and effects of this aspect of aquarium management in my next article. Hopefully aquatic chemistry will become less of a mystery to those aquarists who follow the articles.

GOLDFISH

"GREAT care must be taken of goldfish, as they are very susceptible; and hence a loud noise, strong smell, violent or even slight shaking of the vessel, will often destroy them. Small worms, which are common to the water, suffices for their food in general; but the Chinese, who bring goldfish to great perfection, throw small balls of paste into the water, of which they are very fond. They give them also lean pork, dried in the sun, and reduced to a very fine and delicate powder. Fresh-river-water must be given them every day. Care must be taken to collect the spawn, when seen floating on the water, as otherwise it will be destroyed by the fish themselves. This spawn is put into a vessel, and exposed to the sun, until vivified by the heat. Goldfish, however, seldom deposit spawn when kept in vases. In order to procure a supply, they must be put into reservoirs of a considerable depth, in some parts at least, well shaded at intervals with water-lilies, and constantly supplied with fresh water. At a certain time of the year, numerous barques are seen in the great river of Yangft-se-Keang, which go thither to purchase the spawn of goldfish. This is obtained with no small care, for towards the month of May, the inhabitants close the river in several places with mats and hurdles, which extend nine or ten leagues, and leave only a space in the middle sufficient for the passage of boats. The spawn is stopped by these hurdles, and the water being afterwards drawn up, and put into large vessels, is sold to merchants, who send it to all parts. Goldfish were introduced into England about the year 1691, but remained exceedingly scarce till 1728, when a great number were brought over, and presented to Sir Matthew Decker, by whom they were usually distributed round London."

The above appeared in a book containing a collection of items of varying interest and published under the title: Enquire Within in 1861. Contributors were recognised as leading experts of the time but retained their anonymity.

The *Xiphophorus* Genus (5) The Maculatus Group

Written & Illustrated by Barry Durham

THE PLATIES form the third and final group—Maculatus—of the *Xiphophorus* genus, and with seven species and sub-species it is the largest. Taking them alphabetically, the first is the sub-species *X. couchianus couchianus* or the Northern Platy.

It is found in a part of the Rio Grande system close to Monterrey and is cut off from other members of the genus. It is essentially a lowland fish from sluggish waters so there are no hooks on the gonopodium. The body is deep and taller than the Swordtail, rather like the Variatus Platy for it has a narrow caudal peduncle. As with almost all the platies there is no trace of a sword in the tail.

While it may look like the Variatus in body shape it is easily distinguished from it by its rather drab, inconspicuous coloration. It is dark brown above the lateral line and light brown below it. The two zones are separated by a very faint zig-zag stripe which may be missing altogether on some specimens. The only other markings on the body are three fairly regular rows of deep-lying dark spots on the caudal peduncle.

The dorsal fin is quite small and rounded and is usually colourless but may sometimes bear a row of tiny black dots and a black band. The other fins also bear no colour.

They are a fairly easy fish to maintain in the aquarium providing the water is well filtered and aerated. The tank does not need to be too big but it should not be overcrowded and it needs some well planted corners. A temperature range of 24° to 26°C (75° to 79°F) is tolerated and a wide range of foods is accepted providing some green matter is included.

Very little is known about its breeding habits but as it resembles the Variatus Platy in many respects it is possible that its breeding habits are also similar.

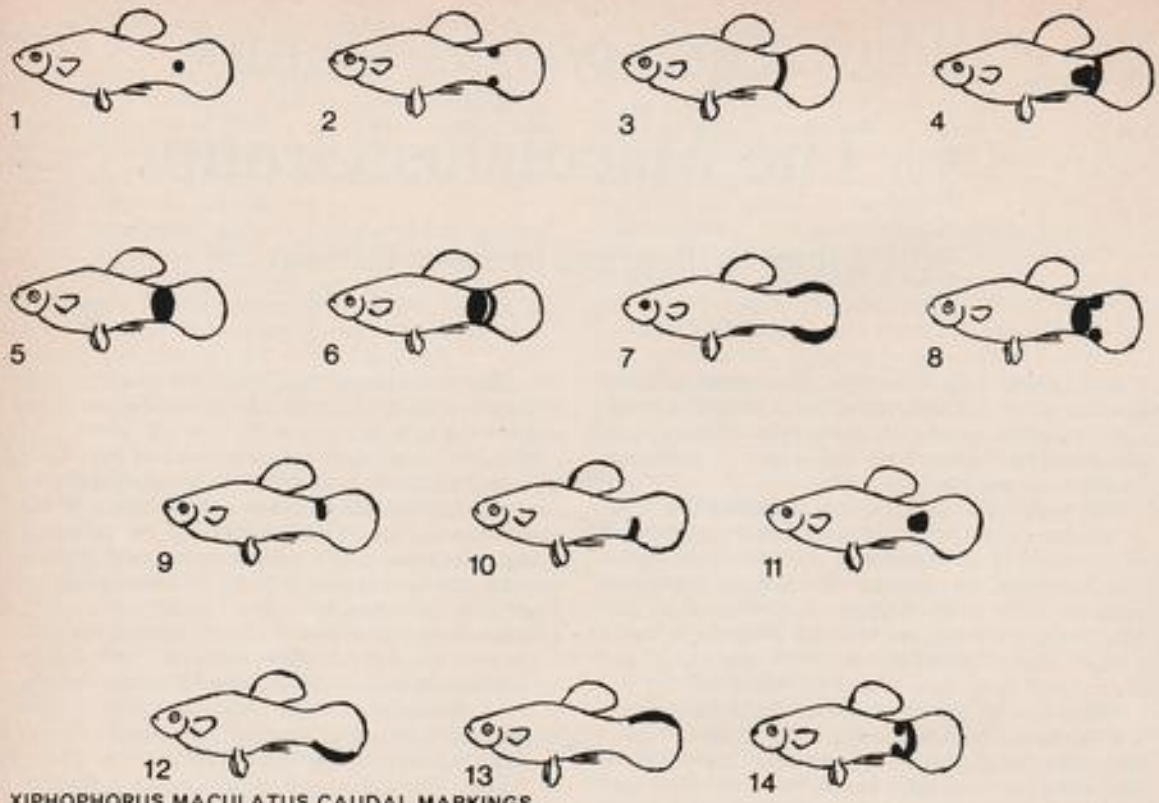
Even less is known about its closely related sub-species *X. c. gordoni*. Sizes are the same: males about 3·5 cms (1¼ in.), females to about 6 cms (2¼ in.) but gordoni prefers more sluggish water with plenty of aquatic plants. It lives in muddy holes and even in shallow pools around the Rio Santa Catarina in Mexico. It is very similar in nearly all respects to the preceding sub-species, but there are minor differences which warrant the establishment of a separate sub-species.

Third in the group is probably the most popular of all aquarium fishes—the Platy (*Xiphophorous maculatus*). This fish has probably done as much, if not more, than the guppy in popularising the aquarium hobby. Its many colour variations, its hardy nature, and the ease with which it is bred have made it an established favourite for many, many years. The wild fish from the lowland waters of Central America is not such a colourful fellow, however. But it does have almost as many variations in its natural habitat as its domesticated cousin. It can be pale to dark brown with a yellow or olive cast, blue-grey to grey, or blue-green on the sides, and the belly may be yellow or white. The gill covers usually reflect a metallic blue or green sheen and there may be spots on the caudal peduncle. Males show two to five greyish bars on the sides. The dorsal fin may have some colour depending on the intensity of the body colour, but the other fins are usually just a faint translucent white, apart from the tail which has a pale greeny-white or metallic blue lower border.

It is also interesting to note that the spots on the caudal peduncle group themselves into seven definable patterns, and these patterns and combinations of them, produce some of the well-known names under which Platies are sold. Names like "Comet," "Moon," "Mickey Mouse" and "Twin Spot." Some patterns are rarer than others and yet others appear as modified versions of the basic. This obviously produces a multitude of caudal peduncle marking combinations.

The average wild platy reaches about 3·5 cms (1¼ in.) while the female may attain 6 cms (2¼ in.). Aquarium-bred specimens can be larger than this because many of them have some form of *X. helleri* ancestry which leaves the fish with an increase in size after the "sword" element has been carefully bred out.

In its natural habitat the Platy likes still, lowland waters, as evidenced by the deep body shape, and it is only rarely found in rivers and streams. Even these must be slow-flowing and here it seeks the slowest



XIPHOPHORUS MACULATUS CAUDAL MARKINGS
KEY: 1. One Spot, 2. Twin Spot, 3. Simple Crescent, 4. Complete Crescent, 5. Moon, 6. Complete Moon, 7. Comet, 8. Mickey Mouse or Moon with satellites, 9. Cut Crescent (Top), 10. Cut Crescent (Bottom), 11. Axe head, 12. Lower Comet, 13. Upper Comet, 14. Guatemala Crescent.

NOTES: Marks 1 to 7 are the seven main patterns according to Dr. Myron Gordon. No. 8 is actually a modification of the Complete Moon (No. 6) but the fact that it has now become quite common warrants its individual mention.

Only two of the markings appear on any one Platy at any one time. Very occasionally similar markings appear on some other members of the genus, notably, *X. milleri*, *X. montezumae*, *X. pygmaeus* and *X. variatus*.

Patterns 9 to 14 are partially developed or modified ones which sometimes appear. No. 14, the Guatemala Crescent, is probably the rarest of all and fish with this tail marking invariably also have two small black spots on either side of the lower lip.

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water close to the banks. It likes plenty of aquatic plants where it can hide and does best in slightly hard water.

During the rainy season when the rivers and streams overflow and inundate the nearby pools and swamps where the wild Platy lives, it is often swept far inland and left stranded in flooded fields. A hollow in the ground may form a new home in the shape of a shallow pool, and if this is deep enough to last through the dry season, a new local population may become established. Acclimatisation takes place, perhaps altering the colouring of the fish over succeeding generations to fit in with its new surroundings. It is these circumstances which have led to the Platy occupying an area of around 600 square miles in Southern Mexico, Guatemala and British Honduras, and to its "discovery" on many different occasions, and in many different places, since 1848—hence its dozen or so synonyms.

In the aquarium it does best between the temperature of 20° and 25°C (68° and 77°F) in a tank with a densely planted back and sides leaving the centre free for swimming. Aeration is not as important as with some of the other *Xiphophorus* species as the fish prefers quiet waters, but filtration is obviously an asset.

A pregnant female will give birth to up to 80 fry

after four to six weeks and like the other members of the genus does not need a separate fertilization for the next three or four subsequent broods. The fry are about 7 mm (¼ in.) long at birth and with plenty of space and the right food will grow to sexual maturity in three to four months.

Feeding is little problem for this omnivorous species with live and dried foods being taken. Algae or other green food should also be supplied as well to keep them in peak condition.

There are two sub-species of the Variatus Platy. The commoner one, and the one from which all the colour forms are derived is *Xiphophorus variatus variatus*. The other, *X. v. evelynae*, is smaller and not as colourful.

Taking *X. v. evelynae* first, as in their order in the Maculatus group, we find a smallish fish only reaching 4 cms (1½ in.) for the male and 5 cms (2 in) for the female, living in the source areas of Mexico's lowland waters. The main rivers involved are the Tecolutla and Cazones and their tributaries. It has a longish head and high back, but the caudal peduncle is short as in *X. maculatus*. The body is coloured a pale orange-yellow with between eight and twelve black transverse bars of varying intensity on the sides. Some specimens also show spotting, also of variable intensity and extent. The dorsal fin is quite large with the front half a pale lemon colour. The tail is longer in proportion to the body than its relatives, but is colourless, as are the other fins. As *X. v. evelynae* is from flowing water the aquarium should be well filtered and aerated with plenty of space for swimming. Dense planting is not necessary and vegetation need only consist therefore of a few clumps dotted about the tank. Water temperature 20° to 24°C (68° to 75°F).

After a pregnancy of five to eight weeks the female gives birth to anything from 20 to 100 fry, but differs from the other members of the genus by taking two or three days to fully deliver her brood instead of a few hours. The young are slow growers taking up to eight months to mature and a further four months to become fully grown. They take live and dried and vegetable food and are especially fond of algae.

X. variatus variatus inhabits similar waters to evelynae but prefers the cooler areas further upstream, only very rarely penetrating the warmer waters lower down. Body shape is more like *X. helleri* with a longish caudal peduncle, but is rather stouter. The males reach 5·5 cms (2¼ in.) and the females 7 cms (2¾ in.). Coloration is very variable, but the basic form has a yellow or orange front half to the body progressing into olive-green overlaid with a bluish iridescence. The sides are covered with irregular dark marks and sometimes up to six dark transverse bands. The species has the largest dorsal fin of all the wild platies with the most number of rays and on certain spectacular specimens it can approach the "sail" of the mollies in size and beauty. It is a pale yellow colour, sometimes with a reddish tinge, as in the tail. Other colours which are prominent in the wild are dark brown, blue-green and a coppery red. Dark edges to the scales overlay the colour with a reticulated pattern. Females are similarly coloured, but paler.

Like its closely related sub-species, *X. v. variatus* takes about a year to fully "colour-up" and for the fins to fully develop. Breeding also follows the same pattern with the birth taking place over several days. It is best therefore to leave the female on her own in a tank with plenty of plants along the back and sides. Floating plants can also be used but they should not be too dense or cover the whole of the top of the water. Average water temperature should be between 20° and 24°C (68° to 75°F), although much lower temperatures will be tolerated. In their natural habitat it often falls into the upper fifties Fahrenheit (about 14°C). All the usual foods are taken, especially green ones.

The final member of the entire family is the Spiketail Platy (*Xiphophorus xiphidium*) which may yet turn out to be, as postulated by Donn Eric Rosen, a further sub-species of *X. variatus*. However, its body form is more like that of *X. maculatus*, so no doubt the argument will rage for a while yet before it is finally settled. It comes, as do all the others, from the rivers of Mexico, and was first discovered by Dr. Myron Gordon in the Rio Purificacion which runs into the Rio Sota la Marina near Ciudad de Victoria. The male looks very like *X. maculatus* apart from the short spike on the lower edge of the tail, but the colour is very different. It is a pale olive-yellow with a silvery belly and a dark zig-zag stripe running along the lateral line. Some fish show two or three extra stripes and dark transverse bands. Two dark spots are evident at the top and bottom of the caudal peduncle. The dorsal fin is dark with a white band, but the other fins and the short "sword" are colourless. The female bears only the lateral line stripe and the caudal peduncle spots. All her fins are colourless. Males reach 4 cms (1¾ in.), females 5 cms (2 in.).

Broods are fairly small—up to 30 in number, and appear after a pregnancy of six to eight weeks. Raising the fry has proved a little difficult, however, as the youngsters seem to be quite delicate and a high proportion of them produce deformities such as hump-backs. They need plenty of space if they are to develop properly and fully.

Adult fish like as much live food as possible but will take dried and vegetable matter, especially algae.

Temperature range is from 22° to 25°C (70° to 77°F) and the tank should be well filtered and aerated as rivers are the fishes' natural habitat. Planting should be done round the back and sides of the tank to give hiding places for fry and young timid fish as well as plenty of space for swimming.

Xiphophorus xiphidium

Xiphophorus variatus evelynae

Wild *Xiphophorus variatus variatus*

Xiphophorus couchianus couchianus

Wild *Xiphophorus maculatus* showing "Moon" marking

Ameca splendens

A LIVEBEARER WITH A DIFFERENCE

by John A. Dawes

REPORTS of "new" fish are not uncommon in aquarium journals. However, most of these new fish are only new in the sense that they have been developed (often experimentally) from already-existing varieties. The many types of guppies, mollies, swordtails and platies are just a few examples belonging to this large category. Attractive and interesting though these fish may be, they cannot really compare with those (fewer) genuinely new finds that occasionally come to the notice of biologists. One such new find is *Ameca splendens* which was formally described by Miller and Fitzsimons as recently as March 1971 in a joint paper which should certainly be read by anyone contemplating keeping these rather unusual and, in many ways, exciting fish (Copeia No. 1, Mar. 8, 1971). *Ameca splendens* is a Goodeid fish (Family Goodeidae) found in the wild in the Rio Ameca Basin of Western Mexico from which it takes its generic name. Like other Goodeids (all incidentally restricted to Mexico), *Ameca splendens* possesses some rather unusual features. In 'normal' livebearers, the most distinctive anatomical feature of males is the presence of a gonopodium—*Ameca* males do not possess one. Instead, the first half-a-dozen or so rays of the anal fin are shorter and closer together than the remainder, giving the fin a distinctly notched appearance. Exactly how this structure functions in sperm transfer is not yet clear but if observations that I have carried out in another Goodeid, *Girardinichthys* (*Lermichthys*), where copulation takes longer than in *Ameca* are anything to go by, the male folds his anal fin in such a way that the notch comes to lie directly in line with the female's vent, sometimes actually achieving physical contact. Garth Nelson in a paper on courtship in *Goodea atripinnis* (Copeia, No. 3, Aug. 5, 1975) reports that the anterior lobe of the male's anal fin is actually wrapped around the female's vent with the notch making contact with the anterior margin of the female's anal fin in such a way that a pocket-like structure is produced via which sperm is squirted by the male into the female. In *Ameca*, the precise moment of copulation takes a very short time indeed and occurs while the fish are in motion thus making detailed observation rather difficult. Superficially, though, it resembles both examples just cited. Whatever the actual mechanism may be, it is certainly effective since adult females in the presence of males are almost invariably pregnant!

Sperm Transfer

While the precise moment of sperm transfer may be difficult to observe, the displays leading up to it are not. These are many and varied, with a very fine balance dividing courtship from aggression. As a result, the former often develops into the latter in the space of a second or two.

A male will approach a female from any direction and begin his courtship display by placing himself at right angles in front and slightly below the female thus blocking her way. A variation on this theme consists of a jerking series of body movements in which the male swims within the field of view of the female, displaying as much of his fins and iridescent colours as possible. If this is successful, he usually ends up at right angles to the female as just described. Once in position he spreads his fins, tilts his ventral region towards the female (tilting his dorsal fin away from her as he does so), slightly bends his body into a rather stiff-looking "shallow S-shape" and quivers violently. The female's body is by this time in a slight head-down position as she observes the male. If she is reproductively unreceptive, she usually responds by rushing at the male who gives up his stance and takes immediate evasive action. On occasion, he will "stand his ground" and the result is a brief, energy-packed squabble which consists largely of tight circling punctuated by short, sharp direct rushes by either party. Very little damage, if any, ever occurs. If the female is reproductively receptive, however, she does not attack. Instead, she usually shakes her head as she faces the male who takes this as a signal to proceed to the next stage. This consists mainly of "reversing into position," and is a relatively quick movement. The correct position is beside and slightly below the female (facing in the same direction!). At this time both fish come to lie very close together and, at a very precise moment, they spurt forwards and upwards as sperm transfer is effected. After this, they each go their own way and pay no further attention to each other.

Successful Mating

If mating has been successful, one can expect a brood in six-and-a-half to eight weeks. This is rather a long time compared to other livebearers, but then *Ameca* is no ordinary livebearer. The small eggs are kept by the mother inside the ovarian follicles until

most of the yolk is used up. When this happens, the embryos pass back to the larger, posterior part of the ovarian cavity where they complete their development. This section of the ovary receives secretions from other parts and contains a relatively high concentration of blood vessels. The embryos can therefore develop in an oxygen- and food-rich environment. They take maximum advantage of these highly favourable conditions through the development of ribbon-like structures called trophotaeniae which seem to have the equivalent functions of the placenta and umbilical cord in mammals. Most probably as a direct result of this, newly-born *Ameca* fry are very large and well-developed. Sizes of up to 1·5 cm. are not at all uncommon, though considerably smaller fry do occur, particularly those produced by small females.

Birth is a highly variable event taking from as little as ten minutes in some small females to well over one hour in larger ones. Size isn't the only controlling factor though. If the fry are being born head-first, then there can be as little as thirty seconds between births. If, however, a fry begins to emerge tail-first, then it can take thirty minutes or more. Just before birth itself, the movements of the fry as it struggles to emerge can be observed as a series of momentary bulges that appear and disappear on the female's abdominal wall. This is followed by "dilation" of the vent area and, finally by a slight muscular contraction of the female's body as she helps the fry on its way.

Heavily pregnant young female dissected to show position of unborn fry inside ovarian cavity and their relatively large size.

Not Cannibals

Unlike other livebearers where cannibalism is commonplace, *Ameca splendens* adults show very little interest in their fry. It is probably because of this that the flight reaction so evident in normal livebearer fry does not seem to be so highly evolved in newly-born *Ameca*. Instead, they spend their time resting at the bottom or swimming gently up towards the surface in apparent disregard of any *Ameca* adults that may be present. On those occasions when closer-than-usual attention has been paid to a newly-hatched fry by an adult, the actual focus of attention has tended to be the trophotaeniae (which are trailed along for a time after birth) rather than the fry itself. Once the trophotaeniae have been dropped, swimming and overall mobility become somewhat easier and the process of integration within the *Ameca* community can begin.

Easy to Feed

From the outset, young fish will eat the same type of food as adults who present no real difficulty, though they do prefer some vegetable matter in their diet. They appear to be particularly partial to plants such as *Synnema* and *Ceratopteris* and, although inclusion of these plants in their diet would be desirable, it could prove rather expensive in the long run. Stouter plants such as some *Cryptocoryne* and *Echinodorus* species seem to stand up quite well to the presence of *Amecas*.

Water conditions are not critical, the fish apparently withstanding hard tapwater with the same ease as soft rainwater. In fact, Miller and Fitzsimons report a considerable amount of pollution at the site of their "type collection." Temperature tolerance seems to be equally flexible. I have kept specimens in temperatures ranging from 65° to 86°F with no apparent ill effects.

Bonus

Ameca splendens, therefore, seems to have a lot going for it. There is an added bonus, though. On top of all these advantages, these fish are rather attractive. Males are somewhat smaller than females (up to (at least) 6·5 cm. standard length compared to 9·0 cm.) but what they lack in size they make up for in coloration. The sides of the body carry numerous blue/green iridescent scales which reflect light very effectively, particularly during displays. The chest region is diffuse yellow/orange. There is a horizontal, fuzzy-edged black band running from behind the head to the caudal peduncle where it ends against a faint crescent of small black dots. The caudal fin is quite spectacular in males. It carries a vertical black band followed by a bright yellow/orange one of similar width. Females are considerably drabber, being almost uniformly speckled and having considerably fewer iridescent scales than males. All fins are fuller in males, with the anal fin carrying that very characteristic notch referred to earlier in this article.

There is a considerable amount of information available on *Ameca splendens* and other Goodeids but there is still a great deal to be discovered. Much of this information can be obtained from the home aquarium—details such as maximum size of adults and fry, brood sizes in relation to parental size, temperature, food, water conditions, etc. The list is endless—here's hoping that some readers will take up the challenge.

Behaviour of *Herotilapia multispinosa* Females

Written & illustrated by Jørgen Hansen & Pamela Stewart

WHEN purchasing a new species, we always buy at least four in order to be fairly sure of obtaining at least one of each sex. When acquiring the American cichlid, *Herotilapia multispinosa*, we also followed this method of procedure as the fish were too small for sexual differentiation.

This species was described by Günter in 1869, and is found in Central America, from Panama to Nicaragua. It is a yellowish-brown in colour with an irregular black stripe running along the body beginning at the eye and ending in a black spot at the base of the caudal fin. Its spawning colouring is bright yellow except for the belly which turns almost completely black. Maximum size is stated to be 12 cm. for males and 10 cm. for females.

Our four newly-acquired fish, 6 cm. in size, were placed in a 200-litre's tank together with a pair of *Cichlasoma festivum* which were also to be conditioned for spawning. After the course of six months, we decided that the time was right for a spawning, and therefore caught up the two which seemed to have formed a pair, and isolated them in a 50-litre's tank, the back wall of which was built up with large lumps of coal. Two days later one of the pair displayed a large swollen ovipositor, and was busy cleansing a lump of coal. The partner in the meantime did not seem particularly interested and displayed only an indication of a breeding-tube.

Late that evening the spawning began: the female glided slowly over the stone while the yellowish eggs, about 2 mm. in diameter, plopped down through the ovipositor and stuck to the stone. This continued for about twenty minutes until the second fish, which gradually approached, began to wolf down the eggs. The female then rushed towards the aggressor, chased it away, and immediately after continued producing more eggs, which were again devoured by the other. Things continued after this fashion until the devouring fish simply could not eat more; this did not, however, deter it from chewing thoroughly the remaining eggs only to spit them out thereafter. We reckoned that the male's disturbed behaviour must have been due to the stress of having been moved.

Two days later our presumed male spawned on another stone just as large a portion of eggs as her "mate." Both females now guarded the second female's spawning by fanning fresh water over the eggs and consuming the fungused ones. In the course of six days all the eggs fungused, which was not remarkable, as they had not been fertilised.

Later we attempted to mate our two other *Herotilapia multispinosa* in the same tank, with precisely the same result: the first batch of eggs was eaten by the nonspawning female, while the second batch, spawned by the latter, was cared for by both.

After an excursion into town, we came home with two large (10 cm.) *H. multispinosa*, which we hoped were two males of the species. It is hard to sex even fully-grown adults, although females may possibly have shorter fins, and be slightly plumper than their counterparts. Each was provided with a guaranteed female, and each pair was placed in their respective tank. All four fish produced eggs on the same day. In each tank the same procedure occurred: the first female spawned on the chosen site, thereafter the second filled up the spaces by a further spawning. There must have been over a thousand eggs on each stone. These fungused in the course of the usual six days. Both females then looked after the eggs in co-operation.

Conclusion

When one provides one's fish with an adequate and varied diet, then one can hardly prevent the females from setting roe. It is then enough for females to be isolated in a tank with a differing water type and a slightly higher temperature for them to attempt to spawn.

Each female has an instinctual need to spawn and to care for her eggs and offspring. The witnessing of an egg-laying by a female of the same species seems to have triggered off a frustration in the female who was not herself ready or able to spawn.

As a curiosity, we can mention that the six females have now the company of four newly purchased *Herotilapia multispinosa*, and if these also turn out to be females, we may be said to have a valid excuse for giving up the attempt to breed this species.

1. Smaller of two females hovers vertically over stone as she cleans it.

2. The first eggs appear. The "spare" female swims around in a confused manner.

3. Female No. 2 greedily eats the eggs at which the first female rushes her.

4. The thief is pushed away with the snout.

5. Almost immediately female No. 1 lays a new clutch of eggs while female No. 2 continues her egg-eating.

6. Female No. 1 attacks second female who signifies submission by curving her body in S-form.

From a Naturalist's Notebook

by Eric Hardy

NATURAL COLOUR PHOTOGRAPHY has not replaced entirely the art of painting fish-portraits. The artist's difficulty has been to capture the iridescence of the silvery scales. None achieved this better than Mrs. T. Edward Bowdich, wife of the African traveller, in her work on British fishes published so long ago as 1828. She sat on the banks of lakes and streams painting fish-specimens immediately the angler caught them for her, before their natural colours faded. I was recently able to examine this rare and valuable work, whose text was merely a cradle for her separate excellent paintings. I wonder if she gained such silvery lustre in minnow and salmon by mixing some essence of their scales, like the manufacturers of early artificial pearls?

She includes some quaint old fishes of Yarrell's lists, no longer accepted as more than local variations. They included Stockbridge Trout differeng from the Rickmansworth Trout on that part of the Thames, Thames Shad, Glut Eel and Grig Eel. Her Barbolt was the burbot, her Pride the lamprey. A southerner, she had little experience of northern fish and, wishing to come to Knowsley Park in Lancashire to paint the Azurine, a blue variety of roach in its lake, she found the then Earl of Derby so unenthusiastic over the idea that she relied upon the Rev. Ellis Ashton of Houghton (a village in Ribblesdale) sending a specimen. She describes this with slate-blue sides, a bluish back ranging to silvery white, a deep blue head, the gill-covers tinged blue and gold, fins dusky with a light tinge to the anal fin, ventrals and caudal.

Her text was confused when she gave its origin in the River Alt (the source of the Graining, an old variety of dace) and stating this river rises in Knowsley Park, when it flows outside the park from Huyton to the sea. Her account of the Graining attributed it to most streams in Lancashire; but we knew only two, the Alt and the Cheshire Weaver. She noted its body and head pale yellowish drab, its back tinged red-lilac, its sides silvery with a yellow hue, the belly white, iris yellow-golden like the gill-covers, lips pale rose and fins pale drab. It had small scales raised in the middle and was claimed better eating than dace.

Waterlife research in this country is now more generously subsidised. The 1976-77 Report sent to me recently by the Government's £4¾ million Nature Conservancy (HMSO £3·10) includes grants of £2,710 to study lowland raised bogs, £1,630 for a study of aquatic flowering plants in Norfolk dykes, as well as £15,530 for East Anglia University's broadland research, £4,520 for a field study of disused parts of the Shropshire Union Canal, £3,750 for a River Wye vegetation survey, £2,874 to monitor Loch Leven's plants and £17,429 for a desk study of British fresh-water ecosystems. £5,550 went on causes of water-plant decline in Norfolk's Thurne Broads, and £50 to dredge a dyke at Barton Broad, £17,531 studying the effects of aquatic herbicides, £960 to survey Dyfed and Powys wetlands, £1,200 for a plant-survey of the Somerset Levels, £64 to net pike to safeguard young waterfowl on Loch of Lowes and £175 to make three ponds at Bawsfinch reserve, Edinburgh. This is apart from marine waterlife, like £224 for skin-divers to survey sea-urchins, and a further £260 to study edible sea-urchins at Lundy. The 2½ years study of sand-lizards on Ainsdale (Southport) dunes cost £4,410.

The Council is concerned about harmful effects of uncontrolled releasing of foreign fish, and the use of rotanone to kill coarse fish to make room for new rainbow-trout farms, as it distorts the structure of insect and other waterlife communities. It has eliminated Britain's most northerly population of carp.

Much more research is covered by the 1976 Report received from the Institute of Terrestrial Ecology (HMSO £3·50) ranging from the plankton productivity of Loch Leven in relation to depth, wind, temperature and light, like daphnia becoming concentrated in areas of down-welling water in wind-movements, and cyclops-distribution related to age and swimming ability. Experiments with cyanatryn herbicide to rid dykes of waterweeds had some unexpected results. The chemical release was slow, taking five or six months to reach maximum concentration, not the predicted two or three weeks; and because of this, eradication of weeds was not achieved until 12 weeks after treatment. A polythene protective barrier did not prevent its movement into untreated areas, with elimination of their submerged plants too. Certain water-bugs and molluscs also suffered drastic reduction.

Many an aquarist is fascinated by sex or colour-changes in fish, and some ways of achieving this is by injecting methyltestosterone into *Tilapia zilli* to change its sex. Young dogfish when hatched have four types

of colour-cells against three when adult. Colour-paling by sharks and rays for camouflage is activated by a hormone secreted into the blood by the pituitary gland. Flounders and other flatfish change colour to match their surroundings. Fishermen's claims of distinguishing races of cod by colour often confuses their change from "red" to complete grey according to the bottom.

Dr Huntsman, Director of the Canadian Atlantic Biological Station, placed a sculpin in water in a white basin and, turning to look for it shortly afterwards, thought it had escaped, until he put his hand into the water when it regained its dark appearance. Cod were shown to change colour when moved from one light cement tank to another in shade. Graphic changes from light to mottled dark by the North American bluespot goby, *Coryphopterus nicholsii* are shown under submission after contacting another in the aquarium. It then shows the blue spot immediately beneath the large black eye, which gives its name. This fish is a bottom-dweller on Californian beaches, moving in short, quick spurts for feeding, territory-defence or escape. Normally, it retains its pale yellow-white colour camouflaging on the sandy bottom of even dark rocky areas, for its black eyes and dorsal tip break its outline. On contact, two adult fish display, facing each other with mouths open and head lifted, the loser turning dark and mottled and dashing for safety. Eventually, a hierarchy is established, according to studies by J. W. Wiley at California State University. Other fish show colour-changes or darkening when fighting, especially males like our common goby which also gapes its mouth and stiffens its fins in aggressive display.

After the fund-raising Red Book listing rare mammals and birds claimed to be faced with extinction, a Red Data Book list of 321 British plants claimed to be threatened with extinction includes several aquatic or waterside species. These include strapwort, *Corrigiola littoralis* whose tiny white, often red-tipped and green-eyed flowers grow on the banks of pools in Hertfordshire and Northants and are spreading along a Derbyshire railway. This also came in ballast by the railway at Hightown and Freshfield on the old South Lancashire coast. Also tiny white starfruit or thrumwort, *Damasonium alisma* of gravelly Southern and Midland ponds; small fleabane, *Pulicaria vulgaris* (misnamed!), a small, downy, much-branched annual of sandy pondsides between Milford and Whitley in Surrey and other southern and eastern sites; and Gloucestershire's adderstongue spearwort or snakes-tongue crowfoot, our rarest buttercup *Ranunculus ophioglossifolius* another annual whose warty fruits vary annually in quantity in a small marshy meadow at Badgeworth Nature Reserve near Gloucester, a pond on a common at Hawkesbury and at Up Hatherley, near Cheltenham.

A ditch protected on Yorkshire's Skipwith Common is the only known British haunt of two aquatic beetles. This is also the main British haunt of the marsh square spot moth, though it may not have been seen since 1950. It is also a haunt of the reed-feeding silky wainscot, which occurs also at Wicken Fen, and of such mainly East Anglians as the reed-feeding southern wainscot (which also breeds in Cheshire at Ince Marsh, Nantwich and Gayton) and the obscure wainscot. A hybrid sedge with only two known British haunts is fenced off on the northern end of the new Brenig Reservoir, on the Denbigh Moors, an SSSI area of unusual basic nature with a pH of 7 or more, due to the sweet water of the Afon Fech in a mainly acid, Silurian moorland.

WHAT IS YOUR OPINION?

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

Photographs by the Author

I'VE JUST returned from a tiring but pleasant week in London and am faced with the prospect of bashing out all of this month's feature in a couple of days. I hope I'll make it on time!

I'll begin with some comments from Mr. Richard Townsend, of 59 Ironwood Drive, Vernon, Ct. 06066, U.S.A. He writes ". . . Our society, the Exotic Fish Society of Hartford, Inc., has just elected me Property Manager; and also being Vice-President, Publicity Chairman, and Reviews Editor of our Bulletin, I have been quite busy . . . I would like to thank you very much for the sample of Java moss. I have separated it into two pieces to place into two of my tanks. It is flourishing in my community tank, which has a neutral pH, and receives only enough light to prevent algae from choking it; and it seems to be holding on in my soft and acidic killifish tank. When it needs to be thinned out I shall offer it to others in our society—and they shall know from whence it came.

". . . I'd like to end this letter with a short story concerning my three-year-old son. I have six tanks ranging from 48 in. × 12 in. × 20 in. to 18 in. × 12 in. × 12 in. My two largest are in my living-room, and the remainder are in the basement. I like to keep my tanks clean and relatively free from mulm. Necessarily, I try to clean at least one power filter every other day until they are all clean. Up until a few days ago I had an *Astronotus ocellatus* and a *Lepomis gibbosus* in one tank; they were named, obviously, Oscar and Punky. These two were my son's favourites. I think he'll be an aquarist later on because he took his plastic beach pail, went into the yard, picked up two rocks of approximately 5 in. in diameter, placed them in the pail and filled it with tap water. The rocks are, naturally, nicknamed Oscar and Punky. Each day he does a complete water change. My wife, the other children and I thought it was cute; but not so much as when over the past week-end, when the snow had melted, my son discovered a small plastic box, near the garden, that my tomatoes for last year had come in. He brought the plastic box in the house and placed it next to his pail with his rocks, Oscar and Punky, and said that he had just bought them a filter to keep the water clean. . . . I believe that I shall pick up a few feeder goldfish and help him to get started in this wonderful, relaxing endeavour."

Mr. T. Buckley says: "I've only just discovered the joys of keeping Oscars and I would be grateful if any of your readers could supply me with information about their experiences with Oscars." He lives at 19 Ellerncroft Road, Wootton-under-Edge, Glos.

Mr. L. Greenhalgh's home is at 24 Newland Street, Crumpsall, Manchester, and he has the following to say. "This is my third attempt to reach you as regards the breeding of my blue acaras. Try as I might I cannot get the fry past the second or third day of the free-swimming stage. The following details have been put in a nutshell for your information before I carry on with one or two more requests. Pairs perfectly healthy; tank size 36 in. × 15 in. × 12 in.; temp. 80°; pH 7·0; good plant growth; U/G filters.

"For the first three spawnings the parents were left with the eggs; but each time the eggs were eaten after the second or third day. For the last four spawnings the leaf or slate was removed, put in a small hospital tank, and the said tank was then floated in the large tank. The first and second time the leaf was placed in aged tap water at 80°F; the third and fourth time the leaf was floated in the same water as the large tank—all at 80°. Of course, at all times methylene blue was used. Every time the eggs hatch out bang on time; every time I get an average of 200 fry; every time they are full of life at the free-swimming stage; and then I come down on the third or fourth morning—and find 200 very dead fry, and all pure white in colour. That is where my story ends. Will some reader come to my aid—possibly Mr. D. E. Battle, who wrote an article, in the April 1977 *Aquarist*, about his blue acaras? If this gentleman would be so kind as to get in touch with me I would be most obliged. P.S. An airstone was used at all times."

The Reverend Robert V. Hughes resides at 87 Whitchurch Lane, Edgware, Middlesex. He writes: ". . . I started keeping tropical fish when I came out of the army after National Service in 1955. Soon I was quite captivated by the hobby and built a fish house to contain my expanding hobby. I continued

to keep fish for about four years until marriage came along. I returned to the hobby later when we kept some goldfish in a very large tank; and then twelve months ago I took up tropicals again. Now the whole family enjoys this fascinating hobby as much as I do. How the hobby has changed in those years! In 1956 neons were 15/- each; and now they are 5 for £1·00!

"The main reason for writing is the letter by Mr. D. Morgan, of Aberdare, which you quoted in the February issue. I would like to balance Mr. Morgan's enthusiasm for digital thermometers by pointing out that they are affected by the temperature of the air *outside* the tank as well as the temperature of the water *inside* the tank. To prove this I have done a test on my three tanks this morning and record the results for you.

"I have my three tanks in a unit in the hall. One has a digital thermometer and the others have the 'Dumpy' clockface type of thermometers. One of these latter tanks is disconnected at the moment and not heated as I am in between breeding operations and want to cut the fuel bill during this very cold spell. (Have you ever wished you could cuddle up in one of your nice warm tanks with your fishes? How well off they are!) This tank, therefore, remains at room temperature.

"This morning the air temperature in the hall was 59°F. The unheated tank showed 60° on the 'Dumpy' thermometer. The other tank with a 'Dumpy' thermometer, which is heated, showed 75°; and the third tank, with the digital thermometer, showed 73°. I checked the three tanks with a good-quality, laboratory, mercury thermometer which I have tested in boiling water and melting ice—correct in both cases—and found that the two 'Dumpy' thermometers were giving a reading within 1°F. of my test thermometer. However, the digital thermometer was registering 6° *colder* than the test thermometer showed the water temperature to be. If I had adjusted the thermostat on the evidence of the digital thermometer I would have raised the water temperature to somewhere in the 90°F. (*sic*).

"When the air temperature is near that of the water temperature, say 65°F to 70°F, digital thermometers are accurate; but when there is a big difference between air and water temperatures they only reach a compromise reading. In the end it is only safe to measure the water temperatures of tanks and water we may be adding to them by a good-quality, laboratory thermometer. This is the only way, I feel, to ensure the well-being of our aquatic friends."

Master N. Holden has the following to say from his home at Priors Stables, Church Street, Exning, Newmarket. "This letter is about lace gouramies. I have not as yet had any success in breeding them. I have an outstandingly beautiful male and two beautiful females. At the moment the male is chasing one of my females that looks very plump. I think they have failed to breed because of the time of year; but I should appreciate any other people's opinions and details of their experiences with these beautiful fish."

No. 45 Deptford Terrace, Sunderland, heads the following letter, written by Mr. Ron Hill. "I'm a member of the Fancy Guppy Association. We have just started a new section in the Tyne & Wear area. Anyone interested in guppies can write to me for full details. One of the main live foods I use is micro worms; this is how I cultivate them.

"I use a square, plastic container of approximately 7 in. × 7 in. × 4 in. Into this I put yellow corn meal to a depth of ¾ in. I then mix dry yeast in water until the water turns milky. This is mixed with corn meal until a sloppy mixture is obtained. A micro worm culture is added; a piece of smooth wood, 4 in. × 2 in. × ¾ in., is placed in the centre of the culture. The top of the wood is level with the top of the culture mix; and after a day or two this wood is covered with micro worms. I remove them with a small paint brush which is swished about in the tanks. I can get two or three feeds per day from each culture; and I keep eight cultures going at once. A lot of people who use Ready Brek, etc. have to renew their cultures every four or five days. By using corn meal and dried yeast I'm able to keep mine going for at least two months before renewal. In fact, I've had one culture going for six months.

"When the culture starts drying out I mix more yeast water with the culture until I get a sloppy mixture. I do this every time the top dries out. If I have no yeast I find that a drop of beer will do the job quite well. I've found that by using yeast the smell from the culture is more acceptable than that produced by any other mixture. I keep mine at 65°F."

A couple of weeks ago I sent for some killifish eggs. They arrived in good condition and several fry had hatched out before I left for my week in London. Unfortunately I was unable to find anyone skilled enough to feed the fry while I was away; and when I returned I found no signs of any baby fish. Some few unhatched eggs remain and I'm hoping that they'll produce fry that I'll be able to raise to adulthood.

Mr. P. D. Roe's address is 26 South Road, High Fetherley, Bishop Auckland, Co. Durham. He writes: "Two years have passed since my first and only letter was published in *W.Y.O.* At that time I was keeping Malawi cichlids and various other fish such as gold velifera mollies. My fish house now contains 12 tanks—two 48 in. × 18 in. × 12 in. four 36 in. × 12 in. × 18 in. and six 24 in. × 12 in. × 12 in. I was recently disgusted at the dealers in my area as I had 20 Malawi cichlids, 16 pairs of jewel cichlids and over 400 convict cichlids; and it took

me over a year to give some of them away; and I ended up having to destroy half of them to make way for other fish. None of the dealers around the area would even have them as a gift. Surely they could have sold a few of them!

"I still keep a few cichlids but now nearly all my tanks are planted out and I am breeding swordtails and platies to make myself a small income to cover the cost of running my tanks. The tanks are lit by Gro-Lux lighting for 12 hours per day and my plants thrive on it. Without doubt my best-growing plant is water wistaria, which is abundant throughout my tanks.

"My swordtails and platies are kept in water of pH 7·2, at a temperature of 80°F. I have not yet lost a fish—except those dying of old age—and all of them are disease-free.

"Recently I bought a pair of kribensis which I put in a 36 in. tank, on their own, and to my delight they have just spawned and produced about 60-70 eggs on a rock which is well shaded by plants. It will be interesting to see if they will look after and rear the fry themselves.

"I have been breeding golden velifera mollies for over two years now and at present I have curbed my breeding desire for a while to concentrate on other species. On a recent visit to my local dealer's I bought a pair of marbled velifera mollies. These were a speckled colour and have the distinct characteristics of a normal velifera. I have put these into a 36 in. tank on their own and although they are looking in fine condition they have not bred yet. I hope I may get some fry in the future as these fish, in my opinion, are much more colourful than other veliferas.

"I keep a 48 in. community tank containing angelfish, American flagfish, several gouramies, velifera mollies, swordtails, four small black sharks, clown loaches and kribensis, and all these fish live in harmony with never a ragged fin. My fish are fed twice per day on various brands of flake, earthworms, *Daphnia*, bloodworms and white worms. I do not like feeding white worms every day as my fish tend to get very fat; so I restrict their diet of white worms to every other day. My longest-lasting piece of equipment was an old neon thermostat that was very cheap when I bought it; and it has just ended its days after six years of good life. It was the first thermostat I ever bought. I have a Diatom power filter and my tanks are filtered with this twice a week for one hour per tank. I also change the water in every tank about once a week, changing about 1/3 each time. My fish seem to thrive on my methods; and anyway, I have yet to hear one complain.

"At the end of last year I built a small concrete pond in the garden; it is 14 ft. × 12 ft. × 3 ft. deep;

but I decided to wait until this year to put any fish in it as winter was nearing. I would like to put about six 6 in. koi in my pond; but people have said that it is not deep enough to winter them; so I intend to build an indoor pond, 8 ft. × 6 ft. × 2 ft. deep, inside my fish house, and to light it with two 4 ft. Gro-Lux tubes to winter the koi. I have put a couple of goldfish and four golden orfe into the pond to test it for free lime and other chemicals; and they are living all right.

"I made my own U/G filter by making holes in a piece of hose and spreading it around the deep end of the pool and then covering it with gravel. This hose is attached to an old agricultural pump from a tractor and this in turn is driven by an electric motor and a fan belt. The water is pumped back into the pool via a waterfall. Compared with most modern water pumps today, my old pump has a much greater turn-over and it makes the waterfall look like Niagara. I intend to buy six small koi in late April and was

shocked by the price of them. I have, however, saved up enough to purchase them so now I must wait until the weather gets a bit warmer. I hope my small pond is big enough to accommodate these fish. A problem I have come across is that of a lot of dust blowing from the field next door, which is ploughed over and ready for sowing, and settling on the bottom of my pond, producing a murky layer on the bottom. Will this harm my fish? I have enjoyed your magazine for four years—and I hope I shall enjoy it for at least another four."

Mr. John Parker, of 61 Burses Way, Hutton, Brentwood, Essex, is treasurer of The Goldfish Society of Great Britain. He writes: "With reference to your *W.Y.O.* feature in *The Aquarist*, I am pleased to enclose a copy of the Society's Standards book and Breeding and Maintenance booklet. I hope these will help you to reply to queries raised in your column; but should you have any particular problem please let me know and I shall try to obtain the answer from one of our senior members.

"Your column this month included comments from the Association of Goldfish Breeders and I feel that perhaps it would be correct to mention that The Goldfish Society of Great Britain is the 'one exception' referred to therein. The Society boasts some 200 members including overseas members in Japan, U.S.A., Australia, New Zealand, Germany, Holland and Argentina. In fact, it is a truly international Society. Perhaps it's the exception that makes the rule! Please don't hesitate to contact me if the Society can help you in any way." (Thank you for the booklets, Mr. Parker. Both make interesting and useful reading and the Standards booklet contains plenty of drawings and details that should enable me to put a name to various coldwater fishes.)

Photograph 2 shows an albino tiger barb. Have you had any success with the breeding of this attractive fish?

"I am trying to obtain some of the unusual livebearers—such as the mosquito fish—but I am unable to get any around this district; so I wondered if any of your readers could help me," wrote Mr. V. Hulme, from 21 Hilltop Drive, Kirkholt, Rochdale, Lancs. Anyone who can help should write directly to Mr. Hulme.

Mr. M. R. Fox, of 24 Kelvin Close, High Wycombe, Bucks., would like to obtain specimens of the following: *Nannostomus marginatus, espei, harrisonii, unifasciatus*; and *Barbus ticto*. "Good price paid," he says. Mr. Fox continues: ". . . My main interest is in pencil fish—*Nannostomus*—which I think are attractive, easy to keep and fairly long lived—two years plus. The main problem is that they are not popular and are therefore difficult to obtain. I have managed to obtain only the three most common species, i.e. *N. anomalus, trifasciatus* and *eques*; the others I have never seen in the dealers' tanks. It seems that the shops are interested only in selling mass-produced, 'Hong Kong' imports of easily produced fish; or expensive cichlids; or catfish which can be sold in very small numbers and bring a good return due to high unit price. The specialist, small fish are not worth selling in small numbers as the amount of profit is not justified by the extra work involved in obtaining unusual fish; and buying in large numbers is not on as the demand does not exist. Maybe your proposal for a Swop Shop would get over the problem. I hope that you can get it started.

"The other fish that is sadly missing from the shops

is the ticto barb, which I haven't seen in this area for three years. It is as pleasant as the rosy barb, has a brighter fin and is just as prolific; so why do we never see it for sale? It is possible to obtain good aquatic plants locally but the prices are highly variable; the only plants that do well in my tanks are various species of *Cryptocoryne*. I have recently used the services of two mail order houses, both of which advertise in your magazine, and both were excellent and saved me about 25-30% over shop prices—including postage and insurance.

"I have never spent a lot on one fish; I think the most was £1·25 on a *Corydoras julii*; but I was very tempted by an *Anostomus anostomus* at £3·25; but I managed to resist. I have managed only one successful spawning; that was with *N. anomalus*. The young are now ten weeks old and doing fine. As for ideas for improving the magazine: I think the best one is your own for a Swop Shop; but I would also like to see an extension of the plant queries and the greater use of colour plates. Keep up the good work!"

Another plea for help comes from Mr. David More, whose home is at 157 Albert Road, Stechford, Birmingham 33. "May I make use of your column in obtaining some fish?" he asks. "For a long time now I have been addicted to cichlids, particularly discus. I also like to see fish kept and spawning in a well-planted, community tank. For this reason, and also for suitable tank-mates for discus, I have tended towards the dwarf cichlids. The only problem with dwarf cichlids is their availability. Rams are easy to get—both varieties, as are kribensis—although these latter grow too large and are a bit too aggressive when spawning. Most dwarf cichlids will live quite happily side by side with only minor skirmishes. However, as I said before, I can't seem to get any. I've read, on several occasions, of people obtaining *A. borelli* through your column. I would love to have a pair of these; any of the *Apistogramma* species; also *Nannacara*, *Nannochromis* and *Cremicara*.

"While home on holiday at Christmas the electricity cut out and I lost all my fish—which included 2 pairs of breeding angels, 2 discus, a breeding pair of rams and a breeding pair of *Cremicara filamentosa*. I now have two tanks back in circulation but they lack that certain something that a cichlid gives a tank.

"Any species of dwarf cichlid will be considered. I travel up and down to Scotland regularly so I could fairly easily pick up any fish. So, there you have it. If you could mention this in your column I'd be grateful."

Photograph 3 shows a mono. Please send me details of your experiences with this species. You may be amused to hear the story of this particular photograph. In 1974 someone wrote to me asking if I could supply a couple of photographs, including one of a mono, for inclusion in a book he was writing. I forwarded the photograph of the mono; and heard nothing more about it until March of this year. The author who wanted the photograph had gone to the other side of the world and the letter enclosing my photograph had followed him. It missed him and reached him only when he returned to England this year. How's that for a well-travelled photograph—delivered 16,000 miles and 3½ years later!

Readers are reminded that I accept no responsibility for the views expressed by contributors to this feature; and I do not necessarily agree with the views expressed. If you'd like to send me a letter for possible inclusion in a future feature, please **print** your name and address clearly and type or write the letter neatly, using only one side of each page and numbering each sheet of paper. Address your letters to Mr. B. Whiteside, c/o *The Aquarist & Pondkeeper*, The Butts, Half Acre, Brentford, Middlesex, England. I regret that I do not have time to reply to readers' queries; such queries should be addressed to Mr. A. Boarder or Mr. J. Hems, as appropriate.

Master Richard Handel's home address is 3 Deacons Close, Elstree, Herts. He informs me: "I have noticed that recently there has been a lot of excitement over the new digital thermometers. Here is my opinion. Their advantages are supposed to be (1) modern looks, (2) high accuracy, and (3) easy to read. I think that they look no more modern than the round, dial type; some for sale at half the price. As for high accuracy, I disagree entirely. It says: 'When the number shows blue, read one above the shown figure, green is the shown figure, and tan, one below.' Well, on mine it sometimes reads as follows: 78 tan (77°F), 76 green (76°F) and 74 blue (75°F) all at the same time! All right, they are easy to read—and they do change quickly; but they cannot be moved about at all, like mercury ones. Which features are important, though? Accuracy is not really, for aquaria; neither is speedy changing of temperature as water in an aquarium heats up and cools down very slowly. Important features for thermometers are, then, easy visibility and stylish looks—both of which the digital one has; but so, incidentally, has the dial type thermometer!

"Moving on to foods: I find live foods—especially for those like me with a small 2 ft. tank—unnecessary except for an occasional treat. My fish accept all dried foods readily, but are particularly fond of dried live foods—*Tubifex* and *Daphnia*—which they attack, making clacking noises as they do so. Foods made to improve colour and health, and liveliness, made by some makers, do not work at all.

"On to filters, of which there are two main types—U/G and those employing a filter wool. It should be possible to kill two birds with one stone by using them both. An undergravel filter, using an air lift, should be able to accept a filter wool just where the air tube

ends. I have not tried this yet—but it should work!"

Mr. T. Spooner's home is at 5 Park Grange View, Mandrake Block, Norfolk Park, Sheffield. He writes: " . . . You asked about the photography of fishes. I have had very good results with almost the same system as Mr. Liotard, of Cheadle. I myself use a Yashica FX1 camera with a 50mm. F/1.9 lens. The film is Fuji 100 ASA colour reversal slide film. The electronic flash is placed on a tripod looking into the tank at 45°. Lens aperture is F/5.6. An extension lead, some 4-5 ft. long, from camera to flash, is used. On to the lens a x4 close-up lens is placed. This has given good results with tetras and other small fishes. Please continue with your most excellent section. I hope my letter will swell the pages a little bit more. May I make one last suggestion: what about a photographic competition, either black and white or colour, with perhaps a judging every three months, and a final at the end of the year?" (That's an interesting idea. What do other readers think? I feel that monochrome prints would be more appropriate than colour prints or slides.)

David W. Talbot is 16 years old and lives at 17a Nightingale Road, Hampton, Middlesex. He has the following to say: "Although I am not replying to any of your specific questions that are published at the end of each excellent *W.Y.O.* article, I feel that I must write and tell you of my recent experiences in Belgium. I had the good fortune to be in that beautiful and diverse country over the Christmas and New Year period, staying in the countryside near Liège, and during that time I was able to visit 'Humblet,' which I found to be the biggest and certainly the most interesting pet shop that I have ever visited. It is situated in the Rue de la Cathèdrale, Liège. This shop contains every type of animal, bird, fish and accessory imaginable, from pheasants to racing pigeons, and from tree squirrels to chimpanzees!

"I was, of course, most interested in the fish section and rarely have I seen a more impressive sight. The many tanks were all very well illuminated and easy to see into. A great variety of species of high quality and good condition were on display to the many attentive buyers and wondering onlookers. Each tank had at least one card, prominently displayed, giving the scientific name (so much easier than any common names), the region of the world from which the fish came and, of course, the price. I had expected, having looked at the other prices in Belgium, that the prices of fishes would be far and away higher than in this country; but I was in for a pleasant shock. Almost every type of fish was cheaper than in this country; a few examples are: *Tanichthys albonubes* at 12p each, 7-in. *Aequidens pulcher* at £1·25, 3-in. *Apistogramma ramirezi* at 70p, guppies ranging from 20p to 55p for a beautiful tuxedo male, gouramies ranging from 16p, to 66p for a large *Helastoma rudolphi*; and of course there were more expensive fish—such as a large *Symphysodon discus*—sp. Heckel—at £17·50.

"The shop also contained a wide-ranging marine section with some of the cheapest fish that I have ever seen, with large *Hippocampus* sp. for under £2, and the *most* expensive fish by a very long margin was a large *Baliste undulatus* at £12, more than double the price of the second most expensive fish. The shop also holds a wide-ranging selection of plants and accessories. If any aquarist goes to Liège then I would urge him or her to visit this marvellous shop.

"Before finishing I would like to pose just one question. Why is it that prices in Belgium are so low? After all, the hobby must be far more widespread in this country; and surely we must be able to import fish from the many Commonwealth countries at favourable rates, as well as producing home-bred fish very cheaply."

For a future feature please send me your views on any of the following: (a) breeding cardinals; (b) cultivating aquatic plants with red leaves; (c) fish houses; (d) breeding coldwater fishes in outdoor ponds; (e) breeding pencil fishes; (f) feeding aquarium plants; (g) cultivating live foods; (h) breeding unusual livebearers. I hope you'll drop me a few lines on any of the above—or on any subject, associated with the hobby, about which you would like to air your views. Good-bye until next month.

SRI LANKA TOUR 1978

WITH the success of our tour of May/June 1977, we are once again planning a similar trip for July/August 1978.

Sri Lanka is the home of exotic marine fish, many *Cryptocoryne* and other true aquatic plants and a variety of freshwater and brackish water fish which find their way to the British aquarist.

The tour will consist of field-study trips to some of the natural habitats of the above-mentioned aquatic species. In addition to this it will also consist of well planned visits to:

(a) Historic and ancient ruined cities.
(b) Wild life sanctuaries.
(c) Glorious and unspoilt palm-fringed beach resorts.
(d) The luxuriant countryside of outstanding and exceptionally breathtaking scenic beauty.

The aquarist will also get the opportunity to see some of the new and rare plant species which are under observation and field research, prior to being introduced to the aquatic market.

Will anyone interested please apply for details to: Dr. Vivian De Thabrew, Suhada Ltd., 4 Somerset Road, Cinderford, Gloucestershire.

News from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 5th of the month preceding the month of publication.

THE quarterly show of the **East Anglian Federated Aquarists** was held in March when the following societies took part: Diss, Ely, Ipswich, King's Lynn, Norwich, Thetford and Great Yarmouth. The host society on this occasion was Great Yarmouth. The unique fee Best Fish in Show was awarded to Mrs. Harmer of Norwich, the winning fish being an excellent red Siamese Fighter. Results Barbs: 1 and 2, Mrs. Turnbull (Ipswich); 3 and 4, N. Cobb (Diss). Characins: 1, W. Turnbull (Ipswich); 2, D. Cooper (Norwich); 3, N. Cobb (Diss); 4, P. Watson (Great Yarmouth). Cichlids: 1 and 3, M. Laws (King's Lynn); 2 and 4, G. Osler (King's Lynn). Dwarf Cichlids: 1, D. Knights (Great Yarmouth); 2, B. Bysouth (Ipswich); 3, D. Cooper (Norwich). Labyrinths: 1, Mrs. Harmer (Norwich); 2, D. Cooper (Norwich); 3, W. Turnbull (Ipswich); 4, R. Watts (Norwich). Toothcarps: 1, S. Cowell (Ely); 2 and 3, M. Weekely (Great Yarmouth); 4, R. Watts (Norwich). Catfish: 1, G. Osler (King's Lynn); 2, V. George (King's Lynn); 3, T. Thorpe (Great Yarmouth); 4, R. Woollard (Ipswich). Rasboras: 1, A. Ford (King's Lynn); 2 and 3, B. Bysouth (Ipswich). Danios and WCMM: 1, R. Watts (Norwich); 2, Miss Auffret (Ipswich); 3, R. Watts (Norwich). Loaches: 1, C. Woollard (Ipswich). AVO Egglayers: 1 and 2, G. Drewry (Great Yarmouth); 3, T. Arnold (Norwich); 4, N. Cobb (Diss). Pairs: 1, N. Cobb (Diss); 2, R. Dorrant (Great Yarmouth); 3, W. Turnbull (Ipswich); 4, S. Cowell (Ely). Guppies: 1, Miss Auffret (Ipswich); 2, A. Ford (King's Lynn); 3 and 4, Mrs. Turnbull (Ipswich). Swordtails: 1, 2 and 4, T. Kemp (Great Yarmouth); 3, A. Ford (King's Lynn). Platies: 1, B. Bysouth (Ipswich); 2, R. Watts (Norwich); 3, S. Cowell (Ely). Mollies: 1, N. Cobb (Diss); 2, B. Tolver (King's Lynn); 3, S. Cowell (Ely). AOV Livebearers: 1, D. Harmer (Norwich); 2 and 3, R. Watts (Norwich); 4, T. Kemp (Great Yarmouth). Breeders: 1, P. Watson (Great Yarmouth); 2, P. Jacoos (Great Yarmouth); 3, G. Drewry (Great Yarmouth); 4, A. Ford (King's Lynn). Junior Tropical: 1, 2 and 3, Alistair Ross (Ely); 4, Cathy Dorrant (Great Yarmouth). Junior Coldwater: 1, 2 and 3, Alison Cobb (Diss). Coldwater Single: 1, A. Ford (King's Lynn); 2, R. Gallop (Thetford); 3, D. Wood (Thetford); 4, A. Wood (Thetford). Coldwater Twin: 1, Mrs. White (Great Yarmouth); 2, A. Wood (Thetford); 3, N. Cobb (Diss); 4, A. Ford (King's Lynn). AOV Coldwater: 1, B. Tolver (King's Lynn).

* * *

AT the annual meeting of the **Atlantis Fishkeeping** Society the following committee was elected: Chairman: Mr. Riley; vice chairman, Mrs. Williams; secretary, Mrs. Williams, 50, Warbreck Avenue, Aintree, Liverpool L9 8DJ; treasurer, Mr. Williams; show secretary, Mr. Taylor; vice show secretary, Mr. Anscott; junior representative, Derek Hampson; committee member, Mr. Sung. Meetings are held every third Thursday each month at:—room above "Plough Inn" Higsons House next to "Dunlops" and facing "Walton Hospital." Rice Lane, Walton, Liverpool 9, Merseyside, Secretary's Telephone 051-525 8104.

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IN March the annual general meeting of the **Yorkshire Koi Society** was held when the following officers were elected: chairman, F. J. Ayres; general secretary and PRO, D. G. Hughes; treasurer, P. Peckett; membership secretary, Mrs. M. Hollom; show secretary, S. Bent; meetings secretary, F. Walker; committee members, R. Sewell, P. Dobson and H. Hughes. It was agreed that subscriptions for the year 1978-9 would be—Member £5, Associate Member £1 (a total of £6 for husband/wife. The membership fee includes copies of the Society's monthly Journal, KOI.

During a break in the official proceedings a most interesting talk on "Spawning Carp" was given by V. Michaels of Newbay Fisheries Ltd. and after the conclusion of the meeting slides were shown of Japanese and American shows. Prospective members will be made most welcome at any of the Society's monthly meetings—details from P. Walker, 7 Richmond Road, Harrogate or any of the Society's officers.

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MEMBERS of the **Evesham Fishkeepers' Society** met in March for the second round of their "Fish of the Year" contest, which features albino Corydoras. Mr. Neville Wing, club vice-chairman, organised a very lively and entertaining "Fish Quiz". An auction sale of show tanks, and equipment followed, proceeds were in aid of Club funds.

Male Livebearers were the subject of the table show with results as follows:—Joint 1, J. Pawlowski and Master D. Goll; Joint 3, Master G. Johns and F. Thornton Fish of the Year Second Round results were:—Joint 1, Miss E. Wright and Mrs. E. Thornton 3, Master G. Johns.

The Society meets on the first Tuesday of every month, at 8.00 p.m. at Church Meeting Rooms, Evesham. Visitors and new members welcomed. Club Secretary: Mr. K. R. Baker, 124, Kings Road, Evesham, Worcs.

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THE main part of the March meeting of the **Mid-Sussex A.S.** was taken up by an interesting Slide Show on Fish on the Show Benches around the country, including some slides of rare fish. Mr. T. Ramshaw of Brighton and Southern A.S. gave the accompanying lecture. On the fund raising side, the Treasurer reported that the recent Tramps Ball had realised a £65 profit. The major fund raising activity, that of collecting scrap paper is still continuing to bring in money. Suggestions were wanted for a stand/display to take to fetes, fairs etc., this year starting with the Dolphin Fair.

The club table show for the evening was judged by Mr. Soper, who remarked on the high quality of fish on show. The cards were awarded as follows: Sexed Pairs Egglayers: 1, B. Perrin; 2, and 4, E. and T. Tester; 3, J. Birch. Sexed Pairs Livebearers: 1, A. McKenzie; 2, E. and T. Tester; 3, L. Pinney. Further details may be obtained from the Secretary, Mr. B. Slade (H. Heath 53747).

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ONE of the points that emerged from a discussion on breeding Goldfish at the March meeting of **Bristol A.S.**, was the need to ensure that there would be an ample supply of food for the fry as soon as they were ready to feed. This very well attended meeting, was the occasion of the first 1978 Tableshow, resulting as follows Goldfish: 1, C. Haves; 2, 3 and 4, W. Ham. Fantails: 1, R. Williams; 2, H. C. B. Thomas; 3, C. Summers; 4, J. Day. Veiltails: 1 and 3, S. Lloyd; 2, R. Pinnock; 4, S. Howells. The Judge for the evening was Mr. J. Savage an ex-President B.A.S.

RESULTS of the **Swillington A.S.** mini-show were: Guppies: 1, J. Muzyka (Morley); 2, Mr. and Mrs. J. Riley (Castleford); 3, K. Wood (Swillington). Platties, Swords and Mollies: 1, Mr. and Mrs. P. Smith (Scunthorpe and Dist.); 2, M. Price (Castleford); 3, S. Hall (Swillington). A.O.V. Livebearers: 1, T. Busfield (Barnsley); 2, M. Walker (Swillington); 3, Mr. and Mrs. P. Smith (Scunthorpe and Dist.). Small Characins: 1, J. Chadwick (Castleford); 2 and 3, A. Frisby (Wyke). Large Characins: 1, T. Stansfield (Castleford); 2, R. Nicholson (Swillington); 3, S. Pogson (South Leeds). Angels and Discus: 1, Mr. and Mrs. Jarman (Barnsley); 2, Mr. and Mrs. Hill (Barnsley); 3, A. Frisby (Wyke). A.O.V. Cichlids: 1, M. Price (Castleford); 2, S. Pogson (South Leeds); 3, Mr. and Mrs. J. Riley (Castleford). Small Barbs: 1 and 3, M. Price (Castleford); 2, Mr. and Mrs. P. Smith (Scunthorpe and Dist.). Large Barbs: 1, J. Chadwick (Castleford); 2, A. Frisby (Wyke). Fighters: 1, Mrs. M. Grey (Wyke); 2, W. Watson (Wyke); 3, J. Muzyka (Morley). A.O.V. Anabantids: 1, L. Bush (Morley); 2, T. Stansfield (Castleford); 3, W. Watson (Wyke). Corydoras: 1, M. Price (Castleford); 2, T. Stansfield (Castleford); 3, K. Wood (Swillington). A.O.V. Catfish: 1, M. Price (Castleford); 2, K. Richardson (Wyke); 3, T. Stansfield (Castleford). Loaches and Botias: 1, R. and S. Cherryholme (Barnsley); 2, E. Rice (Barnsley); 3, Mr. and Mrs. J. Riley (Castleford) Livebearer (Breeders): 1, M. Walker (Swillington); 2, Mr. and Mrs. Hill (Barnsley); 3, T. Busfield (Barnsley). Egglayer (Breeders): 1, M. Walker (Swillington); 2, L. Bush (Morley). Livebearer (Pairs): 1 and 3, T. Busfield (Barnsley); 2, M. Price (Castleford). Egglayers (Pairs): 1, T. Busfield (Barnsley); 2, A. Frisby (Wyke); 3, E. Rice (Barnsley). A.V. Coldwater: 1, Mr. and Mrs. Chadwick (Castleford); 2, Mr. and Mrs. P. Smith (Scunthorpe and Dist.); 3, J. and S. Greenwood (Swillington). Sharks and Foxes: 1, L. Bush (Morley); 2, J. and M. Freer (Swillington); 3, K. Wood (Swillington). Rasboras, Danios and Minnows: 1, E. Rice (Barnsley); 2, J. Muzyka (Morley); 3, Mrs. S. Richardson (Wyke). A.O.V. Tropical: 1 and 3, T. Busfield (Barnsley); 2, A. Frisby (Wyke). Best Fish in Show: Mr. Price.

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THE **Saracens Aquarium Club** meet at The Saracens Head Public House, High Street, Redbourn, Herts. every first Monday in the month at 8.30 p.m. New members always welcome. At the Club's annual general meeting held in March a new Committee was formed and is now as follows: chairman, B. Barford; vice chairman, C. Grimes; secretary, Mrs. A. Barford, 33, Longfield Road, Harpenden, Herts. Treasurer, J. Eaton; show secretary, T. Woolley; P.R.O., A. Grimes.

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GUEST speaker at the March meeting of the **King's Lynn A.S.** was Dr. Ford and his talk on International Aquaria, supplemented with coloured slides was very entertaining, and is highly recommended to any society who has not yet had the pleasure of hearing Dr. Ford.

The bench show, which this month was for the Barb family had 27 entries, and the results were as follows: 1 and 3, D. Manning; 2, A. Freeman; 4, V. George. D. Manning took the trophy for the fish with the highest points for the month.

Meetings are held at 7.45 p.m. on the second Thursday of each month, at the North Star public house, King's Lynn, and new members are very welcome.

RESULTS of the **Reading and District A.S.** Open Show held in March were as follow: Best Fish in Show: C. Howe, Class T, Newbury. F.B.A.S. Trophy, Class K: D. Goss, Reading. Class Ag: 1 and 4, Mrs. M. Rayner (Newbury); 2, T. Waller (Elaps); 3, C. Howe (Newbury). Class B: 1, D. Goss (Reading); 2, A. Campion (Reading); 3, Mrs. D. Cruickshank (Ealing); 4, R. Hollins (Basingstoke). Class Ca: 1, C. & J. Richards (Sudbury); 2, K. Taylor (Havant); 3, A. I. Feast (Tonbridge); 4, M. Dore (Reading). Class Cb: 1 and 4, Mrs. V. A. Feast (Tonbridge); 2, M. Dore (Reading); 3, M. R. Fox. Class C: 1, A. Chaplin (Basingstoke); 2, Mrs. Wethersell; 3, M. Dore (Reading); 4, Bourne & Liston (Selas). Class Db: 1, M. and B. Coe; 2 and 3, Bourne and Liston (Selas); 4, D. C. Ellis (Aylesbury). Class Dc: 1, K. Taylor (Havant); 2, D. Jennings (Havant); 3, S. Pitcher; 4, M. Thomas (Rhondda). Class D: 1, Mrs. M. Nethersell (Riverside); 2, F. May (Reading); 3, R. Canning; 4, D. Jennings (Havant). Class E: 1, A. Campion (Reading); 2, G. Pollard (Reading); 3, Bourne and Liston (Selas); 4, R. Stallwood (Newbury. Class F: 1, Master R. Howe (Newbury); 2, Mr. Witteridge (Sudbury); 3, R. Prior (Newbury); 4, J. Jackson (Basingstoke). Class G: 1, C. J. Richards (Sudbury); 2, A. Jennings; 3, P. Merritt (Reading); 4, G. Arnold (Gosport) Class Ha: 1, F. Fraser (Basingstoke); 2, J. Carpenter (Hounslow); 3, Mrs. M. Nethersell (Riverside); 3, G. Arnold (Gosport). Class H: 1, Mrs. M. Nethersell (Riverside); 2, K. Taylor (Havant); 3, C. J. Richards (Sudbury); 4, P. Rushbrooke (Reading). Class J: 1, Mr. and Mrs. Dansey; 2, R. Hollonigs (Basingstoke); 3, R. Townsend (Newbury); 4, A. I. Feast (Tonbridge). Class K: 1, D. Goss (Reading); 2, Miss J. Waller; 3, P. Lawrence (Reading); 4, T. Cruickshank (Ealing). Class L: 1, C. N. Jackson (Reading); 2, A. Gibson (Reading); 3 and 4, A. I. Feast (Tonbridge). Class M: 1, D. Jennings (Havant); 2, G. Arnold (Gosport); 3, J. Jennings (Petersfield); 4, S. Broome (Reading). Class N-bm: 1, Mr. and Mrs. T. Dansey (Aylesbury); 2, D. C. Ellis (Aylesbury); 3, Bourne and Liston (Selas); 4, Mrs. A. Chapman (Elaps). Class N-ot: 1, M. Thomas (Rhondda); 2, C. Howe (Newbury); 3, I. Lecky (Basingstoke); 4, M. Mansbridge (Soton). Class O: 1 and 4, Mr. Yates (Petersfield); 2, J. Pipe (Aylesbury); 3, F. May (Reading). Class P: A. Hart (Newbury); 2, D. Hambleton (Reading); 3, Mr. Yates (Newbury); 4, C. & J. Richards (Sudbury). Class Q: 1, Mrs. M. Rayner (Newbury); 2, I. J. Sellwood (Newbury); 3, R. Collier (North Wilts.); 4, Mr. and Mrs. Brook (Selas). Class R: 1, Mr. and Mrs. Curles; 2, M. Mansbridge (Soton); 3, R. Canning (Newbury); 4, T. Burvill (Basingstoke). Class S: 1, Anne Jennings (Petersfield); 2, A. Chaplin (Basingstoke); 3, R. Canning (Basingstoke); 4, H. J. Jones (Salisbury). Class T: 1, C. Howe (Newbury); 2, T. Burvill (Basingstoke); 3, D. Cruickshank (Baling); 4, G. Stallwood (Newbury). Class X.B-M: 1, Brenda Young (Newbury); 2, M. R. Fox (Marlow); 3, R. Canning (Newbury); 4, J. Jackson (Basingstoke). Class X.O-T: 1 and 2, C. Howe (Newbury); 3, R. Townsend; 4, M. Thomas (Rhondda). Class U: 1, 2 and 4, F. Pinder; 3, G. Arnold (Gosport). Class V: 1, F. Pinder; 2, A. J. Jones (Salisbury); 3, Mr. and Mrs. Curtis (North Wilts); 4, D. C. Ellis (Aylesbury). Class W: 1, Mrs. S. Hedges (Bethnal Green); 2, D. Goss (Reading); 3, F. May (Reading); 4, F. Pinder. Class Z: 1 and 3, T. Waller; 2, T. Cruickshank (Ealing); 3, M. Waller.

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IN March a very interesting talk supported by a slide show on the behaviour of South American Cichlids, and also the dissection of Aequidens Portalegrewsis to show the internal parts of this species, was given to **Taunton and District A.S.** by Mr. Ian C. Sellich, Head of the Zoological department of Bristol University. Forty members were present.

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THE third National Open Koi Show—"Koi 78"—will be held at a new venue this year on Sunday, 10th September. The Northern Section of the Society will be hosts on this occasion and the delightful new setting chosen is Tatton Park, a National Trust property just off the M6. Admission to the Park is 40p and in addition to viewing some of the most beautiful fish in the world on the tree-lined lawn near the Orangery, the house and park is well worth a visit. *London Section News*; the second London Section Open Koi Show will be held on Sunday, 25th June this year at Van Hages Garden Centre, Ware. Further details will be published later.

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IN the C.N.N.A. inter club league **Aberdare and District A.S.** met **Merthyr Tydfil A.S.** In addition Mr. Hale of Penayernor Bird Gardens gave a very interesting talk and film of his recent expedition to the Amazon. The results of the match are as follow:—Egglayers 1, P. Willis (A.); 2, D. Marsh (M.T.); 3, G. Pugh (A.); 4, P. Stone (M.T 5, C. Morgan.); (M.); 6, P. Burton (A.). Livebearers: 1 and 4, P. Willis (A.); 2 and 6 P. Burton (A.); 3, C. Davies (A.); 5, A. V. Reid (A.). Total points were Aberdare A.S. 32 Merthyr A.S. 10, Aberdare meet every first and third Tuesday monthly at Aberaman Rugby Club. All new members welcome.

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AT the March meeting of the **New Forest A.S.** and following a talk at the February meeting by F.B.A.S. Judge J. Jefferies on how fish are judged, it was decided to let members have a try. Twelve fish were placed around the Hall, and each member with a judging sheet entered their own pointings of each fish. During the second part of the meeting Mr. Jefferies explained the points to look for, and it was felt that by this exercise members would recognise how to select a good specimen to exhibit at open shows. Table show results: Rasbora: P. Norup. Swordtails: 1, J. Menhennett; 2, P. Wheeler; 3, P. Norup; 4, R. Travers. Corydoras: 1 and 2, J. Menhennett.

It was decided that the Society purchase a Trophy, and donate it to the "Southern Association of Aquarist Societies" for use at their annual show as the society is a member of this organisation.

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THE first three months of this year have proved to be a very busy period for the **David Brown A.S.** Early in January, members were entertained with a very interesting slide-show, given by Mr. Derek Harrop (Huddersfield T.F.S.). The subject for the evening was "Building a Fish House," and was in actual fact a record of the fishhouse that Mr. Harrop had built. It may be noted at this time, that the amount of thought and detail that had gone in to this fishhouse was beyond belief. Also in January the first section of the Members Table Show was held. The results were: R.D.M.: 1 and 3, J. Sykes; 2, Mrs. L. Clarke. Characins: 1, Mr. and Mrs. Hardy; 2, S. Moorhouse; 3, J. Sykes. Mini-Jars: 1, J. Sykes; 2 and 3, Mr. and Mrs. Hardy.

In February Mr. Bruce Foden (a local dealer), gave a demonstration of building all glass tanks. He built two tanks, using two different methods. At the end of the demonstration both tanks were auctioned off to members present. Later in February there was a welcome visit from Dr. Peter Lewis who has recently returned home after having lived in the U.S.A. for a while. The subject of Dr. Lewis's slide-show lecture, was "Rift Valley Cichlids." Some of these slides, showed fish, that were rarely seen in this Country.

What is hoped will be the first of many Inter-Society Table Shows with Huddersfield T.F.S. was held in March. With eight classes the competition was very high. The Show was judged by Mr. E. Ward, and the overall result was, David Brown A.S. 22 points: Huddersfield T.F.S. 26 points. Total No of entries 74. While judging was in progress, David Browns Hon President Mr. Philip Moorhouse conducted a very good quiz. A prize was given to the highest score from each side, and the results were. Highest for DBAS Mr. S. Moorhouse. Highest for H.T.F.S. Dr. P. Lewis. It may also be noted in February, members participated in an Invitation Table Show organised by Privateer Aquarist (Shipley). Out of the 42 places to be won, D.B.A.S. took 21 places.

Special Note

Will all aquarists holding an Open Show Trophy belonging to the David Brown A.S. please note that all trophies must be returned to the Show Secretary; Mr. John Sykes 27 Penistone Road, New Mill, Nr. Huddersfield no later than 1st September 1978. Any queries regarding the return of a trophy, please do not hesitate to write to Mr. Sykes or phone the Secretary Mr. A. G. Copp (0484) 43398.

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THE first Spring meeting of the **British Aquarists Study Society** was held at London Zoo on Saturday 11th March. The subject was "The Saltwater Scene" and two papers were presented to the eighty three members and friends present. The first was entitled "Colour Patterns in Coral Reef Fishes" and was presented by Roger Lubbock, Fellow of Churchill College, Cambridge. Members were treated to some excellent colour slides of coral fishes taken on location by Mr. Lubbock together with explanations and theories concerning their many diverse colour patterns.

The second paper given by John Hancock (the David Bellamy of Marine Biology) was concerned with the practicalities of collecting, keeping and studying of native marines found around our coast. Mr. Hancocks' ideas and suggestions were very well received by an interested audience and he will no doubt be in great demand as a lecturer when he returns to the U.K. after four months at Field Officer to the United Services Field Expedition to the Chagos Islands in the Indian Ocean. During the afternoon a Fellowship of the Society was awarded to Peter Bird Esq., for his services to the Hobby and the Society of which he is past Chairman.

For further details of the Society please contact Michael Shadrack, 61, St. Barnabas Road, Woodford Green, Essex.

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ON Easter Sunday, the Annual Open Show of **Hyde A.S.** was held. Mr. and Mrs. Baldwin of Sandgrounders A.S. took the prize for competitor with most points which totalled 15 and Mr. and Mrs. Iddon also of Sandgrounders A.S. won the Best Fish in Show award with a Rift Valley Cichlid, and are now eligible to enter the Champion of Champions section at the British Aquarist Festival in October. The remainder of the results were as follows:

Guppies: 1, A. Hamlet (Northwich); 2, Mr. and Mrs. Campbell (Macclesfield); 3, Mr. and Mrs. Daines (Doncaster). Platties: 1, T. Mackinnon (Southport); 2, B. & B. Durham (Longridge); 3, D. Potter (Warrington). Swordtails: 1, H. Murray (Hyde); 2, B. W. Carter (St. Helens); 3, J. Sykes (David Brown). Mollies: 1, F. & S. Whitehouse (Wolverhampton); 2, F. & M. Baugh (Leigh); 3, T. L. Penny (St. Helens). A.O.V. Livebearers: 1, B. & B. Durham (Longridge); 2, D. Harvey (Sandgrounders); 3, Mr. and Mrs. Baldwin (Sandgrounders). Barbs (Small): 1, B. Wilson (Skelmersdale); 2, R. & A. Johnson (Hyde); 3, B. W. Carter (St. Helens). Barbs A.O.V.: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. & Mrs. Roberts (Doncaster); 3, Mr. & Mrs. Kemp (Sheaf Valley). Small Characins: 1 and 2, F. & S. Whitehouse (Wolverhampton); 3, Mr. and Mrs. Underwood (Southport). Large Characins: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, A. Bibby (Wythenshawe); 3, Mr. and Mrs. Underwood (Southport). Fighters: 1, J. Haley (Darwen); 2, Mr. and Mrs. Tinsley (Sandgrounders); 3, T. L. Penny (St. Helens).

A.O.V. Anabantids: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. Copley (Doncaster); 3, Mr. and Mrs. Underwood (Southport). Small Anabantids: 1, Mr. and Mrs. Copley (Doncaster); 2, J. Sykes (D. Brown); 3, A. Lyons (Longridge). Angels: 1, Mr. and Mrs. Aspinall (Sandgrounders); 2, D. Francis (Merseyside); 3, D. Hughes (Longridge). Rift Valley: 1, Mr. and Mrs. Iddon (Sandgrounders); 2, A. and K. Aldred (Hyde); 3, B. Wilson (Skelmersdale). Dwarf Cichlids: 1, B. Wilson (Skelmersdale); 2, A. S. Toomba (Wythenshawe); 3, T. and W. Brown (Warrington). A.O.V. Cichlids: 1, P. A. Taylor (Atlantis); 2, A. Bibby (Wythenshawe); 3, Mr. and Mrs. Underwood (Southport). Corydoras: 1 and 3, B. W. Carter (St. Helens); 2, Mr. and Mrs. Muckle (Runcorn). Loaches: 1, Mr. and Mrs. J. Riley (Castleford); 2, Mr. and Mrs. Muckle (Runcorn); 3, D. Hornby (Leigh). A.O.V. Catfish: 1, F. and S. Whitehouse (Wolverhampton); 2, Mr. and Mrs. J. Riley (Castleford); 3, Mr. and Mrs. Baldwin (Sandgrounders). Killie Fish: 1, J. Noon (Leigh); 2, G. Wood (B.K.A.); 3, E. Jones (Leigh). Sharks and Foxes: 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, T. and W. Brown (Warrington). Rasboras: 1, Mr. and Mrs. Daines (Doncaster); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Muckle (Runcorn). Danios and Minnows: 1, J. Haley (Darwen); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Miss S. Goddard (Macclesfield). A.O.V. Tropicals: 1, M. A. Hollingworth (Sherwood); 2, C. Wadman (Darwen); 3, Mr. and Mrs. Copley (Doncaster). A.V. Marines: 1, Mr. and Mrs. Iddon (Sandgrounders); 2, M. Taylor (Ind.); 3, M. A. Hollingworth (Sherwood). Pairs (Livebearers): 1, Mr. and Mrs. Goddard (Macclesfield); 2, Mr. and Mrs. Ryan (Sandgrounders); 3, T. Mackinnon (Southport). Pairs Egglayers: 1, A. Vaissiere (Liverpool); 2, F. and S. Whitehouse (Wolverhampton); 3, D. Tomlinson (Macclesfield). Breeders Livebearers: 1, W. D. Haddow (Hyde); 2, J. Sykes (D. Brown); 3, B. & B. Durham (Longridge). Breeders Egg C. & D.: 1, A. Vaissiere (Liverpool); 2, D. Francis (Merseyside); 3, D. Hulse (Oldham). Breeders Egg A. & B.: 1, Mr. and Mrs. Copley (Doncaster); 2 and 3, A. Vaissiere (Liverpool). Juniors: 1, S. Tomlinson (Macclesfield); 2, K. Corbett (Merseyside); 3, D. Garstang (Longridge). Mini Jars: 1 and 2, E. Jones (Wrexham); 3, D. Potter (Warrington). Common Goldfish: 1 and 2, Mr. and Mrs. Waller (Chesterfield); 3, S. Nixon (Ind.). Fancy Goldfish: 1, Mr. and Mrs. Harvey (Sandgrounders); 2 and 3, Mr. and Mrs. Holroyd (Morecambe Bay). A.O.V. Coldwater: 1, M. and M. Underwood (Southport); 2, Mr. Heywood (Sandgrounders); 3, A. Whittaker (Macclesfield). Coldwater Breeders: 1, Mr. and Mrs. Waller (Chesterfield).

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MEMBERS at the March meeting of the **Nailsea and District A.S.** were entertained by a very interesting talk by Mr. Curston of the Malvern A.S. on the subject of Filtration. This talk proved most informative and many members gained much knowledge on this rather neglected but very important aspect of fishkeeping. The Society meets once a month, on the fourth Tuesday, at the Highcliffe Hotel, Clevedon. New members and visitors will be most welcome.

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IN March, **Great Yarmouth and District A.S.** were hosts to the East Anglian Federation of Aquarists for their quarterly meeting. E.A.F.A. consists of clubs from: Great Yarmouth (G.Y.), Ipswich (I), Norwich (N), Ely (E), Thetford (T), King's Lynn (K.L.) and Diss (D). At the end of a series of seven quarterly meetings each club receives points for the number of aquarists showing fish and number of cards won. The winning club receives the Wally Card Trophy. The results were as follow: B. Barbs: 1 and 2, Mrs. Turnbull (I); 3 and 4, N. Cobb (D). C. Characins: 1, Mr. Turnbull (I); 2, D. Cooper (N); 3, N. Cobb (D); 4, P. Watson (G.Y.). D. Cichlids: 1 and 3, M. Laws (K.L.); 2 and 4, G. Osler (K.L.). D. A. Dwarf Cichlids: 1, D. Knights (G.Y.); 2, B. Bysouth (I); 3, D. Cooper (N). E. Labyrinth: 1, Mrs. Harmer (N); 2, D. Cooper (N); 3, Mr. Turnbull (I); 4, R. Watts (N). F. Toothcarps: 1, S. Cowell (E); 2 and 3, M. Weekley (G.Y.); 4, R. Watts (N). G. Catfish: 1, G. Osler (K.L.); 2, V. George (K.L.); 3, T. Thorpe (G.Y.); 4, R. Wollard (I). H. Rasbora: 1, A. Ford (K.L.); 2, Mrs. Bysouth (I); 3, B. Mrs. Bysouth (I). K. Danio and W.C.M.M.: 1, R. Watts (N); 2, Miss Auffret (I); 3, R. Watts (N). M. A.O.V. Egglayers: 1 and 2, G. Drewry (G.Y.); 3, T. Arnold (N); 4, N. Cobb (D). N. Pairs: 1, N. Cobb (D); 2, R. Durrant (G.Y.); 3, A. Wood (T); 4, S. Cowell (E). O. Guppies: 1, Miss Auffret (I); 2, A. Ford (K.L.); 3 and 4, Mrs. Turnbull (I). Q. Swords: 1, 2 and 4, T. Kemp (G.Y.); 3, A. Ford (K.L.). R. Platies: 1, B. Bysouth; 2, R. Watts (N); 3, S. Cowell (E). S. Mollies: 1, N. Cobb (D); 2, B. Toller (K.L.); 3, S. Cowell (E). T. A.O.V. Livebearers: 1, D. Harmer (N); 2 and 3, R. Watts (N); 4, T. Kemp (G.Y.). X. Breeders: 1, P. Watson (G.Y.); 2, P. Jacobs (G.Y.); 3, G. Drewry (G.Y.); 4, A. Ford (K.L.). Juniors: 1, 2 and 3, A. Ross (E); 4, C. Durrant (G.Y.). Coldwater—Single Tail: 1, A. Ford (K.L.); 2, R. Gallop (T); 3, P. Wood (T); 4, A. Wood (T). Twintail: 1, Mrs. White (G.Y.); 2, A. Wood (T); 3, N. Cobb (D); 4, A. Ford (K.L.). A.O.V.: 1, B. Toller (K.L.). Junior: 1, 2 and 3, N. Cobb (D). Best fish in show award went to Mrs. Harmer of Norwich with a male Siamese Fighter.

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AN inter-society quiz was the main entertainment of the evening at an inter-club show held on 1st March, **Hyde A.S.** being hosts to **Wythenshaw A.S., Osram A.S.** and **Glossop A.S.** The winners of best fish in show were T. and J. Selby of Wythenshawe A.S. while the exhibitor gaining the most points was K. Aldred of Hyde A.S. The inter-society quiz and the table show was won by Hyde A.S. and over sixty people with more than a hundred fish entries had a most enjoyable evening. New members are always welcome at Hyde A.S. and for further information please contact W. D. Haddow, 18 Laburnum Avenue, Hyde, Cheshire. Tel: 368 3066.

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THERE was a total of 707 entries Benched by 33 societies at the open show held by **Heywood and District Aquarist** in March. The best fish in show award was won by P. and S. Taylor of the Atlantis Society, a Microglanis Parahybae gaining a total of 81 points. Results: Class 1: 1, Master D. Houghton (Southport); 2, R. I. Payne (Merseyside); 3, Mr. and Mrs. Hall (N.O.V.O.S.). Class 2: 1, M. Stevenson (Osram); 2, Mr. and Mrs. Underwood (Southport); 3, Mr. and Mrs. Baldwin (Sandgrounders). Class 3: 1, B. Wilson (Skelmersdale); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Risbridger (N.O.V.O.S.). Class 4: 1, Mr. and Mrs. B. Walsh (Blackburn); 2 and 3, Mr. and Mrs. Underwood (Southport). Class 5: 1, Mr. and Mrs. Underwood (Southport); 2, Mr. and Mrs. Risbridger (N.O.V.O.S.); 3, F. S. and A. Hopwood (Blackburn). Class 6: 1, Mr. and Mrs. Risbridger (N.O.V.O.S.); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, B. and B. Durham (Longridge). Class 7: 1 and 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Mulla (Merseyside). Class 8: 1, Mr. D. Faux (Merseyside); 2, M. Stevenson (Osram); 3, T. W. Brown (Warrington) Class 9: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. Campbell (Macclesfield); 3, R. I. Payne (Merseyside). Class 10: 1, P. and H. Batchelor (Loyne); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, J. D. Haley (Darwen). Class 11: 1, Mr. and Mrs. Muckle (Runcorn); 2, Mr. and Mrs. B. Walsh (Blackburn); 3, T. Hinsley (Bridgewater). Class 12: 1, D. Hornby (Leigh); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, D. Harvey (Sandgrounders). Class 13: 1, R. I. Payne (Merseyside); 2, Mr. and Mrs. Muckle (Runcorn); 3, T. Redfern (Heywood). Class 14: 1, Miss S. Goddard (Macclesfield); 2, Mr. and Mrs. Underwood (Southport); 3, Mr. and Mrs. Risbridger (N.O.V.O.S.). Class 15: 1, T. and J. Durham (Longridge); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Muckle (Runcorn). Class 16: 1, K. and A. Aldred (Hyde); 2, T. Stansfield (Castleford); 3, M. Stevenson (Osram). Class 17: 1, P. and S. Taylor (Atlantis) (Best in Show); 2, Mr. and Mrs. Gough (Wynnstay); 3, P. and H. Batchelor (Loyne). Class 18: 1, Mr. and Mrs. Campbell (Macclesfield); 2 and 3, E. Jones (Leigh). Class 19: 1, J. Noon (Leigh); 2, Mr. and Mrs. Risbridger (N.O.V.O.S.); 3, Masters N. and M. Rimmer (Sandgrounders). Class 20: 1, A. Hamlet (Northwich); 2, D. Conway (Darwen); 3, Masters N. and M. Rimmer (Sandgrounders). Class 21: 1, T. McKinnon (Southport); 2, F. and P. Fisher (Wythenshaw). Class 22: 1, B. and B. Durham (Longridge); 2, J. McCarthney (St. Helens); 3, B. W. Carter (St. Helens). Class 23: 1, G. Potter (Warrington); 2, M. Stevenson (Osram); 3, T. McKinnon (Southport). Class 24: 1 and 2, B. W. Carter (St. Helens); 3, R. I. Payne (Merseyside). Class 25: 1, B. and B. Durham (Longridge); 2, T. McKinnon (Southport); 3, Mr. and Mrs. Underwood (Southport). Class 26: 1, Masters N. and M. Rimmer (Sandgrounders); 2, R. I. Payne (Merseyside); 3, L. Penny (St. Helens). Class 27: 1, Mrs. Griffiths (Runcorn); 2, Mr. and Mrs. Tinsley (Sandgrounders); 3, W. J. Brown (Vale Royal). Class 28: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, B. and B. Durham (Longridge); 3, P. Squirrel (Wythenshaw). Class 29: 1, P. Yates (Blackburn); 2, J. McCarthney (St. Helens); 3, D. Harvey (Sandgrounders). Class 30: 1 and 2, P. Yates (Blackburn); 3, E. B. Calow (Bridgewater). Class 31: 1 and 3, B. Wilson (Skelmersdale); 2, A. Bibby (Wythenshaw). Class 32: 1, P. Ridley (Heywood); 2, P. A. Taylor (Atlantis); 3, Mrs. Ryan (Sandgrounders). Class 33: 1, Mr. and Mrs. Clark (David Brown's); 2, M. Stevenson (Osram); 3, T. W. Brown (Warrington). Class 34: 1, Mr. and Mrs. Gough (Wynnstay); 2, A. Bibby (Wythenshaw); 3, B. Wilson (Skelmersdale). Class 35: 1, Mr. and Mrs. Aspinall (Sandgrounders); 2, G. Kenyon (Skelmersdale); 3, Mr. Hughes (Longridge). Class 36: 1, Mr. and Mrs. Underwood (Southport); 2, B. Wilson Skelmersdale); 3, E. Jones (Leigh). Class 37: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. and Mrs. Gough (Wynnstay); 3, Mr. Hughes (Longridge). Class 38: 1, A. Unsworth (St. Helens); 2, S. Wolstenholme (Heywood); 3, G. Kenyon (Skelmersdale). Class 39: 1, Mr. and Mrs. Iddon (Sandgrounders); 2, Mr. Ashworth (Lytham); 3, Mr. Bough (Leigh). Class 40: 1, A. J. Sweet (Blackburn); 2, Mr. and Mrs. B. Walsh (Blackburn); 3, J. Sykes David (Browns). Class 41: 1, K. Thompson (Merseyside); 2, T. McKinnon (Southport); 3, B. and B. Durham (Longridge). Class 42: 1, K. Thompson (Merseside); 2, Mr. and Mrs. B. Walsh (Blackburn); 3, D. Tomlinson (Macclesfield). Class 43: 1, J. Sykes (David Browns); 2, Mr. and Mrs. Goddard (Macclesfield); 3, D. Harvey (Sandgrounders). Class 44: 1, Mr. and Mrs. Tynsley (Sandgrounders). Class 45: 1, D. Wilson (Liverpool); 2, E. Jones (Leigh); 3, T. and J. Durham (Longridge). Class 46: 1, A. Vassiere (Liverpool); 2, G. Kenyon (Skelmersdale); 3, Mr. and Mrs. Risbridger (N.O.V.O.S.). Class 47: 1, A. Vassiere (Liverpool). Class 48: 1, A. Vassiere (Liverpool). Class 49: 1, Mr. and Mrs. Dawson (Heywood); 2, R. N. Dingley (Heywood); 3, K. and A. Aldred (Hyde). Class 50: 1, R. N. Dingley (Heywood); 2, Mr. and Mrs. Hewitt (Osram); 3, S. Foote (Accrington). Class 51: 1, S. Foote (Accrington); 2 and 3, R. N. Dingley (Heywood). Class 52: 1, R. N. Dingley (Heywood); 2, Mr. and Mrs.

Hewitt (Osram); 3, Mr. and Mrs. Harvey (Sandgrounders). Class 53: 1, Mr. and Mrs. Harvey (Sandgrounders); 2 and 3, R. N. Dingley (Heywood). Class 54: 1 and 2, Mr. and Mrs. Hewitt (Osram); 3, S. Foote (Accrington). Class 55: 1, Mr. and Mrs. Hewitt (Osram); 2, S. Foote (Accrington); 3, R. Dingley (Heywood). Class 56: 1, B. Howarth (Accrington); 2, S. Foote (Accrington); 3, Mr. and Mrs. Hewitt (Osram). Class 57: 1, Mr. and Mrs. Underwood (Southport); 2, S. Foote (Accrington); 3, A. Unsworth (St. Helens). Class 58: 1, Mr. and Mrs. Risbridger (N.O.V.O.S.); 2, D. Heywood (Sandgrounders); 3, G. and C. Berry (Blackburn). Class 59: 1, Mr. and Mrs. Dawson (Heywood); 2, S. Foote (Accrington); 3, P. Fry (Houghton Durham). Class 60: 1, S. Foote (Accrington).

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CHANGES have been made in the show Committee of the **Petersfield & District A.S.** and the officers are now as follow: Show Manager: G. Barkham; Show Secretary: W. J. Crockford, 29 Durford Road, Petersfield, or phone Havant 486056.

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AT this year's British Open Show there will be staged the first leg of the first ever European Guppy Championship. This is a new competition between the F.G.A., the Deutschen Guppy Federation and the Osterreichische Guppy Gesellschaft. Exhibitors will show teams of three matched males which have been bred by the exhibitor. The winner being the exhibitor gaining the highest total points of his best exhibit at each show.

The F.G.A. heat will be on 28th May when the fish will be judged to F.G.A. Standards. At the Vienna Open Show on 18th June the entries will be judged to Austrian Standards and finally at the Berlin International in September the fish will be judged to German Standards.

Judging by the interest these fish will be well worth seeing, the venue being the Glebe Farm Community Centre, Stechford on Sunday afternoon. There is a great interest in the breeding and showing of guppies. If you live in the north east you will see guppies bred by Association members on the F.G.A. stand which is being put on by the Tyne and Wear Section.

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OFFICERS elected at the annual general meeting of the **Littlehampton and Bognor A.S.** were:—chairman, J. Walters; secretary, J. Christopher, 18, The Haven, Beaumont Park Estate Littlehampton, West Sussex, BN17 6NT; treasurer, A. Martin. The society holds its meetings at "The Crown" public house, High Street, Littlehampton, on the first Wednesday and third Thursday of each month at 8.15 p.m. New members and anyone interested in fishkeeping are cordially invited to attend.

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AFTER the Annual General Meeting held in March the **Goldfish Society of Great Britain** committee members are as follow:—President (acting) J. Bundell; chairman, R. Dodkins; vice chairman, H. Berger; secretary, A. Law; treasurer, J. Parker; P.R.O, A. Lawman; show secretary, A. Lesurf; editor, R. Whittington; lay members, G. King, J. Shirley, D. Seymour.

After the election of officers a great deal of time was spent discussing what form the Open Show would take, some members wanting a full days show while others were in favour of splitting the show into two separate days. One day for the show and one day for the auction. After much discussion it was decided to let the new committee make recommendations.

A Diploma was presented to Mrs. P. Whittington for the high state of perfection she has attained in her London Shubunkins strain. The Morris Cluse Rose Bowl, is awarded annually to a member who gains most points at table shows for breeders teams. This year being the first time the award has been given and was presented by J. Bundell to A. Lawman. The last trophy to be presented was for the most popular fish and D. Mills won the trophy with his Calico Orandа.

The members then settled down to a slide show given by A. Lawman, who during 1977 visited many well-known fish breeders to take photographs of the fish houses and ponds. Most of the questions asked as the 150 slides were projected, were about the construction of fishhouses.

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AT the March meeting of **Castleford A.S.** a talk was given by Mr. R. Singleton on Malawi Cichlids. This was enjoyed so much that Mr. Singleton was booked to give another talk in October. March table show results were as follow: Senior Corydoras: 1 and 3, P. Camfield; 2, T. Stansfield. Junior Corydoras: 1, J. Chadwick; 2 and 3, L. Starbuck. A.O.V.: 1 and 3, T. Stansfield; 2, A. Barrett.

Owing to pressure of work Mr. B. Crewen has resigned and the new chairman is Mr. A. Harrison. The society are holding a mini-show on the 9th May at Saville Park, Hightown, Castleford, benching 7-8.

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SIXTY members of **Merseyside A.S.** attended a talk in March on the "Showing of Fish". The lecture was given by Mrs. B. Faux, show secretary, and Mr. F. Mulla, chairman. All aspects of showing were covered and new members were encouraged to attend both table and open shows. The meeting was enjoyed by all and informative.

Also in March a club table show was held. Judged by Mr. Aldrid and Mr. G. Bond: Results: Guppies: 1, T. Faux. A.V. Coldwater: 1, S. Teasdale; 2, F. Mulla; 3, S. Darracott. Fancy Goldfish: 1, S. Teasdale. A.O.V. Tropical: 1, D. Francis. Ladies A.V.: 1, N. Foster. Breeders Livebearers: 1 and 2, D. Francis. Swords: 1, T. Lye; 2, S. Farrel; 3, J. Tabberer. Breeders Egglayers: D. Francis. Pairs (Livebearers): 1, T. Lye; 2, J. Harrison. Platties: 1 and 3, T. Lye; 2, I. Jamieson. A.O.V. Livebearers: J. Lynch. Small Characins: 1, J. Walker; 2, J. Lynch. Pairs (Egglayers): 1, J. Harrison; 2, T. Williams. Large Characins: 1, F. Mulla. A.O.V. Catfish: 1, J. Harrison; 2, B. Faux; 3, D. Francis. Corydoras: 1, D. Francis; 2, S. Darracott; 3, B. Faux. Small Barbs: 1 and 2, T. Faux; 3, T. Killgallon. Angels: 1, J. Faux; 2, D. Francis; 3, J. Tabberer. Large Barbs: 1, T. Lye; 2 and 3, J. Forbes. Fighters: 1, D. Francis; 2 and 3, B. Faux. Rift Valley Cichlids: 1 and 2, B. Faux; 3, D. Francis. Large Cichlids: 1, J. Lynch; 2, B. Faux; 3, J. Faux. Dwarf Cichlids: 1, J. Tabberer; 2, W. Wilde. A.O.V. Anabantids: 1, J. Forbes; 2, W. Wilde; 3, J. Tabberer. Loaches: 1, J. Harrison; 2, J. Walker; 3, T. Faux. R. D. and M.: 1, W. Wilde; 2, T. Williams. Sharks and Foxes: 1, T. Faux; 2, J. Tabberer; 3, T. Lye. Killies: J. Lynch. Junior Coldwater: 1, Miss L. Faux; 2 and 3, F. Lye. Junior Egglayers: 1, M. Cummins; 2, K. Corbett; 3, C. Francis. Junior Livebearers: 1, S. Francis; 2, K. Corbett; 3, C. Francis.

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CHANGES in officers of the **Basingstoke and District A.S.** are: Chairman: M. Strange; Vice-Chairman: Mrs. J. Lovegrove; Secretary: Mrs. V. H. Prall, 20 Marlowe Close; Programme Secretary: P. Martyn.

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OFFICERS elected at the **Wythenshawe and District A.S.** annual general meeting were as follows: Chairman: A. Oldham; Secretary: Mrs. J. Selby, 176 Crossacre's Road Crossacre's, Wythenshawe, Manchester 22 5AA; Show Secretary: P. Squirrell; Treasurer: S. Barratt.

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NEW SOCIETIES

THE recently formed **North Bury A.S.** meet on the third Monday of the month at the New Bury Community Centre, St. Olaves Road, Bury St. Edmunds at 8 p.m. and would welcome any new members from this area. The secretary is D. Bartlett, 96 West Road, Bury St. Edmunds IP33 3LJ.

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OBITUARY

WE regret to report the death of one of the **East London A.P.A.** Vice-Presidents and life member Mr. Frank Arnold, who died on the 28th February, aged 78 years.

Frank joined E.L.A.P.A. in 1948, his principle interest at that time being aquatic plants, especially the Cryptocoryne varieties. As his involvement in the hobby grew, he started to breed tropical fish specialising in the Corydoras species. He found feeding a large quantity of fry a problem and so attended evening classes to study various methods of culturing live foods. Later on he formed I.G.M. Ltd., a company primarily concerned with developing and commercially supplying cultures for the breeding aquarist.

He will be remembered as one of the pioneers instigating the now accepted practice, between societies in London and the Home Counties, of exchanging speakers for club meetings.

We extend our sincere condolences to his family and regret the loss of a popular and respected aquarist.

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B.K.A.

THE **British Killifish Association** is offering information sheets and booklets to any aquarists who are interested in Killifish. The sheets are written and illustrated with photographs by B.K.A. members and describe how to breed various Killifish species. Twenty-seven Scientific Papers are available describing species or groups of Killifish. These have been written by recognised Killifish authorities such as E. Roloff, R. A. Jubb, J. J. Scheel, Prof. Ladiges, Dr. A. C. Radda, A. J. Wright, etc. This information is not published elsewhere and so available at a nominal charge.

Seven Tape and Slide Shows are available for hire by Societies at £1·55 including inland postage.

For a list of publications and slideshows please send a s.a.e. to B. A. Brown, Publicity Officer, B.K.A., 173 Parr Lane, Unsworth, Bury, Lancs. BL9 8JN.

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MISSING TROPHY

THE **Newbury and District A.S.** are trying to locate a trophy which was won at their 1976 Show by Mr. Michael E. Gunn, who at that time lived at No. 17 Cornwell Close, Rowner, Gosport, and was a member of the Gosport Society. The only information the society has is that Mr. Gunn moved somewhere up North and was apparently killed in an accident with a bus.

The trophy is a silver cup with a lid, two handles and black base, and is engraved, "Newbury & District Aquarist Society, The Jordan Cup, Class Da," and was donated to the society by the late vice-president, Les Jordan. All who remember Les will understand how highly the trophy is valued. If any readers can offer any clues as to the whereabouts of this trophy, please contact B. A. Barrett 38 Digby Road, Newbury, Berks. RG13 1TS. Telephone: 0635 41395.

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CATFISH ASSOCIATION G.B.

THE Association have received from Dr. H. Nijsson and Mr. I Isbrucker of Amsterdam University and Zoo, confirmation that they will be lecturing at the November 1978 Convention.

Dr. Nijsson, together with Mr. Isbrucker have completed extensive studies of fish fauna of South America, in particular Surinam. Both ichthyologists have recently revised a greater part of all previous work done on the Corydoras species. This revision and his field work in Surinam will provide much of the background for Dr. Nijsson's lecture. Mr. Isbrucker will most probably lecture on Loricariidae, a group of interesting Whiptail Catfish, about which he has written many important papers. Dr. Nijsson was a member of a team of Dutch scientists consisting of hydeo-biologists, botanists and ichthylogists who were sent out to Surinam to study the effects on the ecology post Dam building. It is understood that these two eminent speakers would be lecturing for the first time outside Holland and museum circles.

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BRITISH CICHLID ASSOCIATION

THE **Hertfordshire Group of the B.C.A.** hold meetings on the third Sunday of each month. Any member or anyone wishing to join is most welcome to come along, and should contact the area representative M. Hanney 205, Perrysfield Road, Cheshunt,

Herts. Hoddesdon 61206. For details of the venue and time.

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SECRETARY CHANGES

Gosport & District A.S.: Secretary and Show Secretary, G. Arnold, 83 Quintrel Avenue, Portchester, Nr. Fareham, Hants.

Petersfield & District A.S.: Show Secretary is now W. J. Crockford, 29 Durford Road, Petersfield.

Northallerton and District A.S.: Show Secretary is now B. P. Summerscales, 97 Long Street, Thirsk.

Don Valley A.S.: New Secretary, W. R. Parker, 3 Ash View, Burncross, Sheffield S30 4ZD. Tel: Ecclesfield 5472. The Club meets Bi-Weekly at the "White Hart Inn," Oughtibridge. New members are always welcome.

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SHOW DATE CHANGES

The Spring show of the Yorkshire Koi Society is Sunday 28th May and not the 29th May.

The Midland Aquarist League Open Show, Leamington is on the 21st May and not 31st May as previously printed.

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CHANGE OF NAME

The Privateer A.S. has changed its name to the **Shipley A.S.** The Secretary is E. Bowers, 128 Main Street, Addingham, W. Yorkshire and they meet monthly on the first Monday in the month at the Rossi Hotel, Saltaire, Shipley.

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NEW SOCIETY

A new Club, has been formed in Swansea named the **Ford Sports and Social Club** (Aquarist Section). Chairman, Mr. L. Taylor. Treasurer, Mr. T. Turner. Secretary, Mr. G. Jones, 82 Kingrosia Park Clydach, Swansea. Meetings are held at Fords Sports and Social Club, Llangyfelach Road, Swansea (third Saturday of each month).

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AQUARIST CALENDAR 1978

7th May: Osram A.S. Open Show.

7th May: Hull A.S. Open Show to be held at the "Blind Institute," Beverley High Road, Hull.

13th May: Port Talbot A.S. open show will be held at The Talbach County Youth Centre, Margam Road, Port Talbot, West Glamorgan. Ample parking space is available. Trophies, plaques, cards for all classes. Schedules will be available by early March from show secretary, A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, West Glamorgan SA13 1AZ. Tel. 3752.

13th May: The Meeting Rooms, The Zoological Society of London, Regents Park, N.W.1 at 2 p.m., a joint meeting with the **British Aquarists' Study Society and the British Cichlid Association** bringing to London from Belgium Mr. Dirk Thys Van Den Audenaerde who will give three illustrated talks on West African Cichlids. Tickets at £1·50 each and tea tickets, if required, at 95p each are available in advance from Mr. W. E. Goodwin, 14 Dawlish Drive, Devon Park, Bedford.

14th May: Gloucester A.S. open show at the Chequers Bridge Leisure Centre, Painswick Road, Gloucester. This show will be run in accordance with F.B.A.S. ruling. Trophies for first and second places plus award cards. Schedules will be available from March onwards. D. Parry, 49 Oxstalls Way, Longlevens, Gloucester (secretary).

14th May: Bournemouth A.S. annual open show will be held at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Show secretary, J. V. Jeffery, 30 Braemar Avenue, Southbourne, Bournemouth BH6 4JF. Tel: 0202 427523.

14th May: Goole and District A.S. Open Show, Bartholomew Middle School, Goole (Provisional booking).

14th May: Wynnstay A.S. Annual Open Show at Bryn Coed Hotel, near Ruabon. Secretary, D. Lloyd, 26 Bran, Plas Madoc, Acrefair, Clwyd.

20th May: Goldfish Society of Great Britain general meeting, 2.30 p.m., Conway Hall, Red Lion Square, Holborn, London, W.C.2.

20th May: Southend Leigh & District A.S. The next open show will be held at St. Clements Hall, Leigh-on-Sea. Further details in due course.

20th May: Merthyr A.S. Third Annual Open Show postponed due to unforeseen circumstances. It is hoped to present the show at a later date. Further details in due course.

20th May: Trowbridge and District A. and P.S. are holding their Open Show at Bradford-on-Avon Rowing Club, Wilts. Schedules will be available from Mr. S. J. Bowery, 1 Dean Close, Melksham, Wilts., from April onwards.

20th May: Southend, Leigh and District A.S. Open Show at St. Clements Hall, Leigh-on-Sea, Essex. Schedules from show secretary, A. J. E. Smith, 39 Willow Walk, Hadleigh, Essex SS7 2RW. Tel: Southend 555540.

21st May: Skegness and District A.S. will hold their First Annual Open Show at the Arcadia Centre, Skegness, good car parking. Schedules from Mrs. M. Butler, St. Michaels Lodge, St. Michaels Lane, Wainfleet, Lincs.

21st May: Merseyside A.S. Annual Open Show at the Rainhill Village Hall, Rainhill, Lancs. Hon. Secretary, J. Bailey, 11 Auburn Road, Liverpool L13 8BJ.

21st May: Midland Aquarist League Open Show, Leamington. Schedules: Mr. F. Underwood, 10 Hyde Road, Kenilworth, CV8 2PD. Tel. 59270.

28th May: Yorkshire Koi Society A.G.M., Wetherby Motor Hotel, (Harewood suite) beginning at 2.30 p.m. A limited amount of time will be spent on business which will be followed by two speakers and an "Any Questions" panel. All welcome.

28th May: Redcar A.S. Sixth Open Show again at the Coatham Bowl, Redcar. Run under F.B.A.S. Rules. Details: telephone Redcar 74599 or write Secretary, 13 Beaucepeth Close, New Marske, Cleveland.

28th May: Leyne Aquarists open show, St. Paul's Parish Hall, Scotforth, Lancaster. Details from Mrs. J. A. Hodgson, 8 Hall Garth Gardens, Over Kellet, near Carnforth, Lancs.

28th May: Bridlington and District A.S. Annual Open Show, will be held at the Hilderthorpe Junior School, Shaftesbury Road, Bridlington. Show schedules available from the show secretary, Mr. M. Jordan, 12 Greenfield Road, Bridlington.

28th May: Portsmouth A.S. Inter-Club Show at the Portsmouth Community Centre, Malins Road, Portsmouth.

28th May: Yorkshire Koi Society Open Spring Koi Show, Fishlake Water Gardens, Fishlake, near Doncaster. Schedules from Mr. S. E. Bent, 20 Oakwood Road East, Rotherham, Yorks.

4th June: Sudbury A.S. Open Show at the Wasps Rugby Ground, Repton Avenue, Wembley, Middx. Schedules from L. J. Brazier, 66 Ormesby Way, Kenton, Middx. Tel: 01-204 5374.

4th June: Loughborough and District A.S. Open Show at Burleigh College, Thorpe Hill, Loughborough. Schedules from J. S. Purdy, 10 Cleveland Road, Loughborough, Leics., LE11 2SP.

10th June: Llantwit Major A.S. "Silver Jubilee" Open Show to be held at the Town Hall, Llantwit Major. To celebrate 25 years of continuous activity we offer superior plaques for 1st, 2nd, 3rd and 4th places in 32 classes judged to F.B.A.S. standards. Schedules available, early May, from J. J. Edwards, "Glanafon," Mill Park, Llanblethian, Cowbridge, South Glamorgan, CF7 7BG.

11th June: St. Helens A.S. Open Show will be held at the same venue as last year's show, Rainhill Village Hall, Rainhill, Nr. Liverpool. Schedules are available from the secretary at a later date.

11th June: Cheltenham T.F.C. Open Show at St. Marks Community Centre, Brooklyn Road, Cheltenham. Schedules available soon.

11th June: Salisbury and District A.S. Open Show, at the Activity Centre, Wilton Road, Salisbury, to F.B.A.S. Rules and Recommendations. Over 40 classes, including six cichlid classes. Show schedules, available in April, from Hon. Secretary, Mr. R. F. Adams, 26 Empire Road, Salisbury, Wilts. S.A.E. please.

11th June: Boston A.S. Open Show at Kirkwood Girls School, Morian Road, Robin Hoods Walk, Boston. Y.A.A.S. rules. Schedules available from secretary, Mrs. M. Sands, 20 Argyle Street, Boston PE21 8PH.

11th June: South Shields A.S. Open Show at Bolingbroke Hall, South Shields.

17th June: S.P.A.S.S. Open Show at Wimbledon Community Centre, St. Georges Road, Wimbledon, London SW19. Show secretary, Mr. L. Clapp, 16 Over Hillway, Beckenham, Kent.

17th-18th June: Aberdeen A.S. Open Show at Music Hall Union Street, Aberdeen. Full details and schedules from show secretary Mrs. G. Forbes, 10 Craigmarvinn Gardens, Altens, Aberdeen. Tel: Aberdeen 872170.

18th June: Corby and District A.S. open show, Civic Centre, Corby. Schedules mid-March, F.B.A.S. rules. C. MacAllister, 18 Maidford Road, Corby, Northants.

18th June: Fancy Guppy Association, North West Lancs./Manchester Section. Annual Open Show, commencing at 2 p.m. Benching from 12.30 p.m. All classes to be judged to F.G.A show rules. Show to be held at The Seton Challon Temple, Savoy Street, Preston. Further details from show secretary, Mr. B. Morris, 4 Irwell Street, Burnley, Lancs.

18th June: Northwich and District A.S. Open Show to be held at Hartford Secondary Modern School (Boys), Greenbank Lane, off Chester Road, Hartford, Northwich. Judging to F.N.A.S. methods and standards. Further details from show secretary, Mr. D. Valentine, 43 Hartford Road, Davenham, Northwich, Cheshire. Tel: Northwich 6624.

18th June: Swillington A.S. Open Show to be held at the John Smeaton School, Barwick Road, Crossgates, Leeds. Schedules will be available from Show secretary, J. and S. Greenwood, 2 Garth End Cottages, Huntington, York YO3 9QU.

24th June: Nailsea and District A.S. Fifth Open Show at Holy Trinity Church Hall, Church Lane, Nailsea. Details from show secretary, Mr. P. Fitchett, 2 Woodland Road, Nailsea, Bristol, Avon.

25th June: Dunlop Aquarium Keepers Society Open Show to be held in Factory Canteen, Speke, Liverpool. Further information can be obtained from either, Show secretary K. Sey, 31 Bray Road, Speke, Liverpool 24 or Hon. Secretary T. Griffiths, 19 Belper Street, Liverpool 19.

25th June: Alfreton and District A.S. Venue, Alfreton Hall. Further information later. Show secretary, P. W. Bonsor, 10 George Street, Riddings, Derbyshire.

25th June: Killingworth Aquarist Association: Annual Open Show at Killingworth "Communicare" Centre, East Bailey, Killingworth.

1st July: Cardiff A.S. Annual Open Show at St. Margaret's Church Hall, Roath, Cardiff.

2nd July: Brighton and Southern A.S. Open Show at Portslade Town Hall, Victoria Road, Portslade, Sussex. Show secretary, M. Rooney, 66 Portlade Villas, Hove, Sussex. Tel. Brighton 411131.

2nd July: Blackburn Aquarist Waterlife Society Annual Open Show in the Windsor Hall, Blackburn. Schedules will be available shortly from the secretary, J. Oldcorn, Highridge, 4 Mollington Road, Blackburn, Lancs., BB2 6EG.

2nd July: The Chard and District A.S. will be holding its Fourth Annual Open Show at Furnham School, Chard, Somerset. Details from Mr. A. Griffin, 24 Thornton Road, Yeovil, Somerset. Tel. Yeovil 23231. Show schedules available end of April.

2nd July: Midland Koi Association Open Show at the Whitley Abbey School, Coventry. Schedules and further information from R. Causer, 8 Swinburne Road, Hinckley, Leics.

7th, 8th and 9th July: Three Rivers Fishkeeping Exhibition to be held this year in the shopping complex Eldon Square, Newcastle-on-Tyne. Further details, contact Show manager, G. T. Liddle, 17 Palmerston Avenue, Walkergate, Newcastle NE6 4RD. Tel: 655794.

8th-9th July: Romford and Becontree A.S. Open Show (Dagenham Town Show). Central Park, Dagenham. Schedules (April): Mr. G. Stepnowe, 35 Coniston Way, Elm Park,

Hornchurch, Essex. Phone: Hornchurch 44057.

9th July: Lytham A.S. Annual Open Show to be held at Lytham Baths, Dicconson Terrace, Lytham, Lytham St. Annes. Benching from 11.00 a.m. to 2.15 p.m. Further details and show schedules from: Show Secretary, P. Ham, 1 Wyndene Grove, Freckleton, Preston, PR4 1DE. Tel. Freckleton 633182.

15th July: Goldfish Society of Great Britain general meeting, 2.30 p.m., Conway Hall, Red Lion Square, Holborn, London, W.C.2.

16th July: Scarborough A.D.A.S. Open Show at Gladstone Road Junior School, Wooler Street, Scarborough. Schedules (March) from J. F. Richardson, 5 Keld Garth, Pickering, N. Yorks. YO18 8DG.

16th July: Sandgrounders A.S. are holding their Open Show at Meols Cop School, Meols Cop Road, Southport. All enquiries to B. Baldwin, show secretary, 10 Olive Grove, Southport PR8 6BG.

16th July: SELAS Open Show at 141 Greenwich High Road, S.E.10. Enquiries to Mr. S. Jeffrey, 83 Alwold Crescent, Lee, S.E.12. Tel: 01-854 0262 (Asst.).

22nd July: Basingstoke and District A.S. once again this year are holding a specialist show for all livebearing fishes in the Carnival Hall, Basingstoke. Schedules from T. Fraser, 151 Culver Road, Basingstoke, Hants.

23rd July: Gosport and District Aquarist Society Annual Open Show at Crofton Community Centre, Stubbington Hants. Show Secretary: Mr. G. Arnold, 83 Quintrel Avenue, Portchester, Nr. Fareham, Hants.

30th July: Dorchester T.F.S. First Open Show. Schedules available from Show Secretary: G. Fox, 4 Wanchard Lane, Charminster, Dorchester, Dorset.

6th August: Blackpool and Fylde A.S. Open Show at St. Kentigerns School, Newton Drive, Devonshire Square, Blackpool. Schedules from show secretary, Doreen Moseley, Flat 80, Forshaw Avenue, Grange Park, Blackpool. Tel: Blackpool 36456.

20th August: Stroud and District A.S. next open show at the Subscription Rooms, Stroud. Show manager, J. Cole, The Hill, Randwick, Stroud, Glos. Tel: Stroud 4504.

20th August: Stretford and District A.S. Annual Open Show is being held at Baile Hill High School, Eccles Old Road, Salford. Details can be obtained from Mr. L. Evans, 67 Edgerton Road South, Chorlton, Manchester.

27th August: Long Eaton A.S. Open Show to be held at Gregory's Rose Gardens, Toton, Nottingham. Schedules available later.

27th-28th August: Great Yarmouth and District A.S. Exhibition 78. Tropical and Coldwater fish plus Society Tableau. Hopton Village Hall (on A12 between Great Yarmouth and Lowestoft).

27th August: Long Eaton A.S. Open Show. Secretary: Mrs. C. A. Simpkins, 47 Pinfold Lane, Stapleford, Notts.

28th August: Petersfield and District A.S. First Open Show at the Town Hall, Heath Road, Petersfield, Hants. Show Secretary, Mr. G. Stacey, 6 Highfield Road, Petersfield, Hants.

28th August (Bank Holiday): The Yorkshire Koi Society Second Open Show will be held at Harewood House, Nr. Leeds. Champion Fish plus the attraction of the House and Gardens. Trade stands will also be present.

2nd September: C.N.A.A. Welsh National Open Show at the Drill Hall, Parit Street (near Bus and Rail, General Station), Cardiff. Details from C. Turner, 146 Arran Street, Roath, Cardiff. Tel: 499982.

3rd September: Bridgewater A.S. Open Show at St. Georges Community Centre, Kenyon Way, Little Hulton, Worsley, Manchester. Details from Show Secretary, M. Burgoyne, 15 Pansy Road, Farnworth, Bolton, Lancs. Tel. Farnworth 792263.

3rd September: Castleford A.S. Open Show, Castleford Civic Centre. Secretary: Miss B. Stansill, 4 Milnes Grove, Airedale, Castleford WF10 2E2. Tel: 559615.

3rd September: Bridgwater and District Aquarist Society. First Annual Show to be held at the Newmarket Hotel, Bridgwater, Somerset.

9th September: Hounslow and District A.S. Open Show at Hounslow Youth Centre, Cecil Road, Hounslow, Middx. Schedules obtainable from show secretary, Mr. A. Constantine, 77 Sparrow Farm Drive, Feltham, Middx. Tel. 01-751 0340.

9th September: Kingston and District A.S. Open Show. The venue will be The Raynes Park Methodist Church Hall, Worple Road, Raynes Park, SW20. Judging will commence at mid-day.

10th September: Longridge and District A.S. second open show at Longridge Civic Hall, Willows Park Lane, Longridge, Preston, Lancs. (15 minutes from the M6). Details available later.

10th September: Provisional date for Huddersfield Tropical Fish Society open show. Venue: Deighton Youth Centre. Show secretary, D. Hill, 11 Westfield Drive, Skelmanthorpe, nr. Huddersfield.

10th September: Huddersfield T.F.S. Open Show. Venue: Deighton Youth Centre. Show secretary, D. Hill, 30 Celandine Avenue, Salendine Nook, Huddersfield. Tel: Huddersfield 650437.

10th September: First Open Show of the Evesham Fishkeepers Society. Venue, Public Hall, Evesham, Worcs. Schedules available at a later date.

17th September: Whitby & D.A.S. Third Annual Open Show will be held at the "Spa Pavilion," Whitby. Schedules will be available at a later date from the Show Secretary.

17th September: Priory A.S. Annual Open Show at St. Anslems Church Hall, Billy Mill, North Shields. Details from Mr. E. Brown, 18 Prestbury Road, Chirton, North Shields, Tyne and Wear.

17th September: Wythenshawe and District A.S. Open Show at the Forum Hall, Civic Centre, Wythenshawe, Manchester.

17th September: Barnsley A.S. Open Show, Ardsley Oaks, Youth Centre, Doncaster Road, Ardsley. Please note change of venue. Benching from 12 (noon) to 2 p.m. Schedules obtainable from: Secretary, M. Whiteley, 80 Clough Road, Hoyland, Barnsley. Tel: Barnsley 742646.

24th September: Midlands Aquatic Study Group Open Show at the Cannock Community Centre, Avon Road, Cannock, Staffs. 37 classes. Judging to FBAS standards. Schedules available May from I. Fuller, 38 Cambrian Lane, Rugeley, Staffs WS15 2XH. Please enclose s.a.e.

1st October: Eboracum A.S. Open Show at Nunthope School, Scarcroft Road, York. Judging starts approx. 2.15 p.m. Show secretary: M. L. Nobler, 6 Bellhouse Way, Ainsty Park Estate, York.

1st October: David Brown A.S. Second Open Show. Held in the Works Canteen, David Brown Tractors, Meltham, Nr. Huddersfield. Schedules available July onwards. For details send s.a.e. to the show secretary, Mr. J. Sykes, 27 Penistone Road, New Mill, Nr. Huddersfield. Or telephone (0484) 43398.

1st October: Midland Aquarist League Open Show, Loughborough. Schedules: Mr. F. Underwood, 10 Hyde Road, Kenilworth, CV8 2PD. Tel. 59280.

1st October: North Wilts. A.S. Second Open Show. Details to follow.

7th October: East London A. and P.K. Annual Open Breeders Show at Ripple Road School, Suffolk Road, Barking, Essex. Show schedules available later from show secretary, Mr. T. Waller, 1 Spursholt Road, Barking, Essex.

29th October: Midland Aquarist League Open Show and Last Inter-Society Show of the Year, Rugby. Schedules: Mr. F. Underwood, 10 Hyde Road, Kenilworth, CV8 2PD. Tel. 59280.

29th October: Doncaster and D.A.S. Open Show. Venue: Don Valley High School, Jossey Lane, Scawthorpe, Nr. Doncaster. Details from Show Secretary, Mr. B. Honnor, 57 Carr View Avenue, Balby, Doncaster.

5th November: Halifax A.S. Open Show at The Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Thirteen livebearer classes, plus eleven coldwater. Furnished aquaria, plants, etc. Schedules sent only on request. S.A.E. to: D. Shields, "Cobblestones," Gaisest, King Cross, Halifax, HX2 7DT, or ring for details Halifax 60116.

18th November: Goldfish Society of Great Britain general meeting, 2.30 p.m., Conway Hall, Red Lion Square, London, W.C.2.

19th November: Northallerton and District A.S. Open Show. Schedules available later, Show Secretary, B. P. Summerscales, 97 Long Street, Thirsk.