

June
1969

the

Aquarist
and Pondkeeper

2/6
monthly



the Aquarist

and Pondkeeper

Printed by Buckley Press
THE BUTTS . HALF ACRE
BRENTFORD . MIDDLESEX.
Telephone: 01-560 6221.

Subscription Rates The Aquarist will be sent post free
for one year to any address for
£1 15s. 0d. Half-yearly 17s. 6d.

MSS. or prints unaccompanied by a
stamped addressed envelope cannot be returned and no re-
sponsibility is accepted for contributions submitted.



Founded 1924
as "The Amateur Aquarist"
Vol. XXXIV No. 3, 1969.

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The Editor accepts no responsibility for views expressed by
contributors.

Editor: Laurence E. Perkins

FISH FOOD

A REVIEW

By B. WHITESIDE

MAN NEEDS FOOD FOR several reasons. These include foods for the production of energy for work and exercise, food for the production of growth and new cells, and food for the repair and replacement of body parts. The diet in man must supply energy measured in calories, proteins, carbohydrates, fats, vitamins, mineral salts, water and roughage. Protein is essential for new growth; carbohydrates supply energy and excess carbohydrates may be stored as glycogen or converted to fat; fat also supplies energy or may be stored; vitamins are needed in small amounts for the body's normal metabolic processes; mineral salts are needed, in variety, for the chemistry of the body; water has a host of uses and roughage enables the muscles of the intestines to move food along its path in the alimentary canal.

A balanced diet for fish is rather similar to that of man. Like man, fish like a varied diet. They could live on one brand of fish food but would surely become tired of it, as we would do if we did not have a varied diet. Although all of the food elements mentioned are necessary for fish, protein is, perhaps, the most important one for growth. A good fish food should contain a balance of all the food elements but a high protein content builds large fish. It pays to check the analyses of fish foods. These can usually be found on the side of the food container. The often quoted "little and often" is a good feeding maxim.

The following is a review of some fish foods which have come my way recently. It is interesting to see how many of the foods are foreign in origin. Perhaps in a later issue I may be able to review a selection which contains more British made foods.

"Variety Fish Food", made by Hykro of Denmark, is the latest food in the Hykro range. It is a flake food

with medium size flakes, and costs 3s. 0d. for a 20 grms. pack. It does not cloud the water and the analysis is: protein 38%, fat 8%, fibre 3%, ash 8% and moisture 10%. It is distributed by The Hykro Dept., Mobberley, Cheshire. It is one of a wide range of Hykro foods and is a good basic food for a wide range of fish—especially if one has a lot of fish.

Thomas's Ltd., of Halifax, distribute the Petcraft range of foods. This includes "Biorell" flake food, another medium sized flake food. It is made in Western Germany. "Biorell Stable Food" is for tropicals and marines. It does not cloud the water and no more than can be eaten in five minutes should be fed at once. Another good basic food costing 1s. 11d. for a small tin but I do not know the weight. The analysis is: protein 45%, fat 4%, fibre 9%, ash 15% and moisture 8%. Petcraft also supply four other foods at present. These are suitable for tropicals, goldfish, marines and turtles. Petcraft "Dried Mosquito Larvae" costs 5s. 0d. for a 15 grms. container. This food can be fed daily or intermittently with other foods. For smaller fish the larvae can easily be crushed with the finger and thumb. Any uneaten food should be removed after 20 mts. A useful food for variety. The analysis is: protein 46%, fat 24%, fibre 5%, ash 14% and moisture 6%. Petcraft "Magic Worms" are freeze-dried tubifex, and cost 3s. 0d. for 5 grms. They can be fed several times daily, either floated on the aquarium water or pressed on the glass. Analysis: protein 55%, fat 2%, fibre 1%, ash 7% and moisture 12%. An especially useful food for larger fish which like a good mouthful. Petcraft freeze-dried "Daphnia" costs 3s. 3d. for a 3 grms. container, and is especially useful for smaller fish as it can easily be crumbled into a fine powder. Analysis: protein 63%, fat 14%, fibre 5%, ash 8%

"A balanced diet for fish is rather similar to that of a man"

... says B. Whiteside

and moisture 8%. Another interesting new food is Petcraft freeze-dried "Fish Egg Meal" which costs 3s. 3d. for 6 grms. This is a good food for a wide range of fish, especially small fish. The analysis: protein 60%, fat 15%, fibre 3%, ash 19% and moisture 3%. These four foods are made in Taiwan, Republic of China. The Tetra Min range of foods is distributed by Herb Royal Ltd., of Bridgewater, Somerset. "Tetra Min Growth Food", is for the promotion of rapid growth in young tropical fish. It does not cloud the water and is a fairly small flake food. It is also good for the smaller tropicals. Costing 5s. 0d. for 1 oz. (approx. 28½ grms.), this food is made in Western Germany.

"Mc. Lynn's Fish Food" is British made by Mc. Lynn's Aquarium, Cranleigh, Surrey. It is quite finely ground food which should be used sparingly. It is useful for a wide range of fish. It contains protein, carbohydrates, fats, vegetable matter, mineral salts and vitamins, but no analysis is given on the plastic box. The ½ oz. (approx. 14 grms.) size costs 1s. 6d.

The final food in this review is "Bio", which consists of laboratory-cultured dried plankton. It was developed by Tigre Biochemical Labs., and is supplied by The Liquifyr Co. Ltd., of Dorking. It is a very good food for the growth of young fish and for the conditioning of adult fish. Any food left uneaten in the tank will form natural infusoria. It has a very high protein content. Analysis: protein 70%, fat 3% and fibre 1%. It costs 2s. 6d. for a 7 grms. tube.

CAPE FEAR SPATTER-DOCK

By B. Fry

THE SMALLER GROWING nuphars—the genus is widely distributed across the temperate and tropical world—are plants of considerable charm. And among the finest species for cultivating in the tropical aquarium is *Niphar sagittifolium*, better known in this country and the U.S.A. (its country of origin) under its popular name of the Cape Fear Spatterdock.

The leaves of this plant are a beautiful fresh green, ruffled along the edges and tissue-thin. They attain a length of about 8 in. and a width (at the widest part) of about 2½ in. They are roughly elongated arrow-shaped, with a deeply indented (cordate) base, a prominent midrib, and a rounded tip. They are held erect on short stems.

Plants grown from seeds are easier to establish (but harder to come by) than plants bought as cuttings (division of the rhizomatous rootstock is still the commonest form of propagation). But provided a healthy cutting is obtained in the first place, there is every chance of its settling in satisfactorily. For the guidance of the beginner, let me say at once that a healthy cutting is one that is firm to the touch and green for most of its length. The possession of some strong white roots near the crown (the portion of the rhizome where the leaves begin) is an added advantage. A cutting showing a lot of brown in the rear half should be rejected at sight; for excessive browning is indicative of an overwhelming decay.

It is of paramount importance to plant a spatterdock (any spatterdock) in a pot of soil. Soil provides a spatterdock with the nourishment it requires to make proper growth. Further, soil appears to prevent or arrest the creeping sickness of decay. The best sort of soil to use is a sifted garden soil that has not been treated with a chemical fertiliser for a year or two. Better still, if you can procure it, a non-fibrous loam.

The seedling plant or length of severed rhizome should be set in the rooting medium with the growing point just above the washed grit, which must be spread over the soil to prevent any muddying of the water. To make the more sure of success, the plant should be started off with only an inch or two of water above the leaves.

The great advantage of the Cape Fear Spatterdock is that the leaves do not lie like flattened hearts on the water, or grow above it. Therefore, it ranks with the best of the spongetons or echinodorus species as a feature plant or centrepiece. Another point is this plant's favour is that it can be acclimatized to normal room temperature if the change from tropical conditions is brought about very gradually. Thus it makes an ideal plant for decorating a tank given over to, say, White Cloud Mountain minnows or black-banded sunfish which, as experienced aquarists know, flourish best in the lower to middle sixties (°F).

IRISH FEDERATION OF AQUARIST SOCIETIES

1st Annual Public Show 6th-9th August, 1969

FROM THE 6TH AUGUST to the 9th the Irish Federation of Aquarium Societies will be staging the biggest show of Tropical and Coldwater fish ever held in Ireland. The Show is being sponsored by Inter-Pet Ltd., through their Irish Distributors S. W. Hamilton, Dungannon.

There will be over 1,000 fish and over 60 fully furnished tanks on display. Add to this water gardens and floral displays, fishing tackle and equipment and a number of trade stands all making a riot of colour and movement.

On public show for the first time in Ireland will be the deadly man-eating Piranha from the Amazon and the poisonous Scorpion Fish, these will be exhibited by the sponsors Inter-Pet on their stand where they are displaying much of the equipment they supply which makes the hobbyists' successes less difficult.

The venue for the Show is the Y.M.C.A. Hall, Wellington Place,

Belfast. It is hoped to have one of Belfast's leading citizens perform the opening ceremony. At present the planning committees are hard at work on all the problems which a show of this size present.

It is the aim of the organisers and sponsors to have this show compare favourably with the best in Britain, as well as having an annual event of which Belfast can be proud.

FIRST SPECIFIC MOUTH FUNGUS CURE NOW ON MARKET

AT THE APRIL PET Trade Fair, K.B. Tropical Fish of Bradford launched one of the most comprehensive range of cures ever to be put on the market by one firm.

Under the trade name "King British," the range at present comprises 20 items, including several items of aquarium equipment.

The "King British" cures for mouth fungus and body slime are the first to be marketed specifically for these diseases and should prove of great help to aquarists, particularly as the body slime ailment affects such a large proportion of live-bearing fish.

For the first time, too, pH adjusters (acidity and alkalinity) are being sold separately so that, once the aquarium water has been tested, the correct balance can be maintained in a given direction.

Brine shrimp eggs

Packaged by "King British" in four sizes, these are finest-quality San Francisco Bay eggs with a high hatching percentage.

New type of safety light fitting

With a moulded rubber fitting which fits up to the base of the bulbs, this new innovation in light fittings keeps the electricity supply totally waterproof and thus ensures complete safety.

A new design in bottom filters has a locking cap and a 360° scavenging area. Small and neat in design, it is very attractively priced.

The "King British" range will be on show again at the 2nd National Furnished Aquarium Exhibition at Bradford in June and at the Aquarist and Pondkeeper Exhibition in July.



KEEPING AND BREEDING

Lacerta vivipara

by H. G. B. Gilpin, B.Sc.



I HAVE KEPT A CONSIDERABLE number of these charming little lizards and bred them successfully on a number of occasions. From six to eight inches long, the Viviparous Lizard, although not vividly coloured, is a shapely and attractive creature. The basic colour, though variable, is greenish brown to medium or dark brown on the upper surface with a broad, dark band through the eyes and along the sides. A similar but narrower line, bordered on each side by a row of lighter spots, passes down the centre of the back.

The males are rather smaller than the females and have orange underparts, sometimes spotted with black. The underparts of the females are usually grey, yellow or yellowish green. This is not an entirely reliable method of distinguishing between the sexes as a number of females I caught in the Swiss Alps all had clear orange abdomens. There was no doubt about their sex as some of them subsequently produced young. The presence of a swelling near the base of the tail in males, which is absent in females, produces a more certain method of differentiation.

The abdomen, as with other members of the *Lacertidae*, is covered with small, rectangular scales. The scales of the tail, which is a little longer than the head and body, are elongated and arranged in transverse rings. Many species of lizards shed their tails when in danger of capture but the Viviparous Lizard seems to do so more readily than most and, if they must be handled, particular care and gentleness are essential.

The only reptile to be found in Ireland, the Viviparous Lizard is frequently encountered in this country and widely distributed in central and northern Europe.

They are at home on sunny banks, in fields, open spaces in woods and marshy ground and are frequently to be found in the neighbourhood of water. Once established in an area they are likely to remain there for many years. In this country they are commonly seen on roadside verges and railway embankments; in Ireland I found them on stony, heath-covered ground, within a stone's throw of the sea and in Switzerland

I saw them in considerable numbers amongst the low growth at the edge of forest tracks or sunning themselves on fallen timbers. In Switzerland, too, many were met with along the banks of fast-running streams and among the huge boulders dotting the sheltered mountain valleys, 4,000 ft. and more above sea level, no great distance below the snow line. Incidentally, apart from a single, very large slowworm, Viviparous Lizards were the only reptiles I saw in Switzerland.

As vivarium inmates Viviparous Lizards have many advantages. They are good-tempered creatures and may be kept safely in mixed groups of males and females. Their non-aggression also extends to other species of comparable size. They soon become tame and spend most of their time in the open parts of their quarters where they can be seen. Although fairly active they do not require a great deal of room and their tolerance of moderately damp conditions means that it is possible to ornament the vivarium with living foliage.

A pleasant appearance can be achieved by covering the greater part of the floor of the vivarium with moss, embedded in an inch or so of leaf mould, and filling in the remainder with a layer of rounded gravel. A few large "rocks" placed on this gravel will provide opportunities for the lizards to sprawl out and bask on their surfaces. A few flowering plants—African Violets are particularly satisfactory—arranged along the back wall is a worthwhile addition. It is advisable to stand the pots in small trays to prevent undue moisture seeping out into the moss and gravel. A strip of rough bark laid across the front of the pots disguises them effectively and provides the lizards with a climbing area of which they are not slow to take advantage.

A water vessel must be supplied as Viviparous Lizards drink freely. Some also like to submerge themselves in the water lying for several hours with just the head above the surface.

They will feed upon most insects small enough for them to swallow, including newly hatched locusts, flies, blowfly maggots, butterflies, grasshoppers and winged ants. Spiders are eaten with enthusiasm and small mealworms form a welcome addition to the menu. Some will eat small earthworms and slugs but many decline to show any interest in either.

Viviparous Lizards are not difficult to breed in captivity. As their name indicates, the young are born alive although occasionally eggs are produced. When this happens they hatch immediately. The newly born lizards are one inch to one and a half inches in length and black in colour. After a month they begin to assume the brown coloration of the adults, the tail being the last part of the body to change.

Growth is rapid provided abundant supplies of food are available. On several occasions I have obtained six baby lizards at a single birth and at times as many as eight. Since these have invariably arrived in July or August, it has usually been possible to provide them with adequate amounts of small animal life. At this time of the year most gardens are infested with more aphides than their owners consider desirable. These, together with ant larvae, tiny spiders and newly born woodlice, are taken

by the baby lizards with avidity. Clumps of newly dug moss contain a wealth of minute living creatures and when introduced to the vivarium provide an excellent reserve of food. If the vagaries of the English summer cause shortage of natural foods from the garden, the babies will feed freely on fruit flies, day-old stick insects and very tiny mealworms. These can all be bred under controlled conditions and are invaluable foods for many species of lizards during the earliest stages of their lives.

Care should be taken to remove the young lizards as soon as possible after they are born to fresh quarters, away from their parents who will show no hesitation in hunting them down and eating them. After producing half a dozen or so young ones the females are very much reduced in condition, with folds of loose skin along their sides, and they need especially careful treatment. They must be given ample amounts of food, in as wide variety as possible, if they are to survive.

Since pairing amongst these lizards normally takes place in May or June, it is not unusual for females caught in July and August to present their owner with a family. I brought back a large female last August from Switzerland in a cellophane bag perforated with pin holes and half filled with dry moss. On reaching home and opening the bag I discovered that she had produced eight fine babies, all of which were in good condition and extremely lively.

Although not essential, I like to provide the babies with a minimum temperature of 60°F as this keeps them active and encourages them to feed. At this stage, too, their water pot should be shallow with gently sloping sides. I have known them to creep into a steep-walled water vessel at night and, being unable to extricate themselves, drown before morning.

In the wild Viviparous Lizards hibernate in this country from October to March but in indoor vivaria I prefer to provide them with sufficient heat to keep them awake and feeding. This does not apply to lizards kept out of doors where adequate provision has been made for them to retreat below ground level beyond all danger from frost.

MUCH ADO ABOUT £5. 12. 6.

by Phillip Brown

AFTER HAVING KEPT ordinary tropical fish for several years I decided to branch out into the hobby of Tropical Marine Fishkeeping as many other aquarists seem to be doing today. The first thing I proceeded to do was to become confused. Deciding to set about this difficult hobby with care and attention, I bought two books on this new hobby, namely, "Coral Fishes" by T. Ravensdale and the "Marine Aquarium" by Wolfgang Wickler. This sounded splendid. Here for a couple of pounds I had acquired the knowledge of two great specialists, but reading through the books I found out a very important thing; they disagreed with each other. T. Ravensdale was in favour of an expensive rust-proof, corrosion-proof aquarium with massive filters on the outside of the aquarium, churning water through them at 100 gallons per hour with ozone being continuously pumped through a protein skimmer which looked like it was worth 12s. 6d. but turned out to cost £3. W. Wickler, however, did not need all this; all he wanted me to get was a watertight container, a solution of salts, a hydrometer, some aeration, a few rocks, adequate illumination, a filter with nylon wool and some heating. Because I was still at school at the time and only earning 30s. a week with about £3 saved up, I decided to compromise and bought a 20-inch bow-fronted plastic aquarium and a Gro-Well bubble-up filter. I put a plastic-bunged heater in the corner, some coral and rocks on the base of silver sand, a thermostat on the outside and an aerator and pump which necessitated me budgeting my earnings for a good week or two. But in the cause of amateur science I carried on and bought two ten-gallon packs of Tropic-Marin, one for the water of the tank and one as a standby.

I did the necessary mixing in a large plastic bucket and my none-too-keen-mother's sink and then put it in the tank and aerated for a week also discovering how well salt water stains red carpets. I then came up against a major problem. Accidentally I spilt some brine-shrimp eggs into the tank and found that when I vacuumed it, not only did the eggs come up but so did the sand and the nearby coral got a fine covering of it. Also the sand showed every mark. I had to do some rethinking.

At that time I had just bought G. F. Cox's book on the "Natural System" of keeping marines so, not one to lag behind scientific developments, I decided to try his system at least to some extent. I kept the filter on the outside but replaced all the sand with gravel leaving only a little silver sand at the front for effect and under this I put an old undergravel filter I had from a tropical tank. Everything settled down so after I had got some money for my birthday I went to a well-known marine fish shop in Croydon and bought a *Dascyllia trimaculata* (Dominoe Damsel), *Thalassoma Dumare* (Lunari wrasse), *La broides dimidiatus* (Cleaner wrasse), two Sergeant Majors (*Abudefduf sexanilis*) and another damsel whose name I cannot remember.

From the word go, things went wrong. First, the unknown damsel got stuck behind a piece of coral (that I wouldn't have thought a spider could have got behind) and died there. That was the second day; also on the same day I discovered that the Cleaner wrasse had developed shock and it took me a week to cure him. Even then he was suffering from malnutrition and, what was worse, the lunari wrasse became jealous of it and bit it to death. Of course that was not all! It seemed when I got them home that the sergeant majors were smaller than they had looked in the shop and both the dominoe damsel and lunari took a dislike to them. One lasted a week the other four days longer. Now I am left with a wrasse and a dominoe damsel both of which fight each time a piece of food is dropped into the tank. So far I have lost about £5 12s. 6d. worth of marines but I have learnt an important moral, that tropical marine fish (coldwater marines may be totally different from this) are much more difficult to mix than freshwater tropicals. Soon I

will probably sell the two fish I have left to a shop or fellow enthusiast because although the fish did not work out, I have proved that anyone, even a schoolboy of 16, can set up a tropical marine tank providing he is very careful of the fish he mixes in it.

NATURE PROVIDES THE MEANS

By Stanley Fox

FOOD MATERIALS CANNOT pass through the tissues of the plants in a solid form; to overcome this, the plants take in through their tissues simple inorganic mineral substances in solution form; these are carbon dioxide, phosphates, sulphates and nitrates.

As these substances possess virtually no energy of their own, the chlorophyll of the plants utilises light as the source of energy to convert these substances into organic materials; these are, carbon, oxygen, sugars, hydrogen, nitrogen and phosphorus.

The essential proteins are formed by the combination of some of the carbohydrates and nitrates. Cellulose is a more complex substance composed of a tissue of fibres arranged in layers; the cellulose is formed when the sugar molecules are joined together by the chemical removal of molecules of water and is used by the plants to form new cell-walls.

These chemical reactions require energy and this is provided by the oxidation of parts of the sugars; other parts of the organic substances form oils and fats. Some of this organic food is used by the protoplasm to make more protoplasm. All these processes of conversion from the inorganic to organic are largely controlled by the protoplasm.

A portion of the oils, starch and sugars not required immediately by the plants, are stored. The plants, when the need arises, convert this insoluble form of food into soluble food by the use of enzymes. The enzymes are directed or brought into use when needed by the nucleus;

the nucleus is the main part of the plant-cell; a membrane surrounds the nucleus and this separates it from the cytoplasm. In effect what happens is that the nucleus directs that the enzymes be brought into action; this order is relayed through the membrane to the cytoplasm which then releases the enzymes to do their work as described. Enzymes are extremely important in the process of photosynthesis and the process of food conversion.

(The nucleus also contains the hereditary factors or materials that govern the form of plants, leaf-shape, growth, and how each plant propagates).

Everyone is familiar with the desert camel's ability to store water within its body to be used by the animal as it requires it. Plants also possess a similar ability though in this instance it is food. Plants that possess rhizomes, tubers or corms, store food in these reservoirs; if for any reason there is a failure of light where photosynthesis cannot take place, then the plants live off this stored food and can live for some considerable time although they cannot grow under these circumstances. This is nature's way of providing for an emergency until light is once more available.

Leaves of plants also store food in some degree; when the sugar concentration is high within the leaf structure, starch formations occur; this happens during the day and at night this starch reconverts back to sugar. The sugar, together with other chemicals, then travels from the leaves to other parts of the plant to be used as and where needed.

High or low temperatures, low or high intensity light, the quality and chemical make-up of water, or a combination in any order of these factors, all play a part in photosynthesis thereby in turn influencing, for better or worse, the complex photo-chemical reactions and related food movements within tropical water-plants.

The coming
Fishkeeping
Exhibition
See page 76

A MINIATURE WATER GARDEN

by Philip Swindells

ANY RECEPTACLE CAPABLE OF holding water is a potential water garden. Old galvanised water tanks, and sinks or baths with their outlets plugged up with putty are all extremely serviceable when sunk in the ground, although the former will eventually corrode and leak unless protected initially by a good coat of a rubber based paint. Discarded wine and vinegar casks also make excellent small pools when sawn in half, but wooden tubs that have contained oil, tar or wood preservative should be avoided as any residue that remains will pollute the water, forming an unsightly scum on the surface.

Before attempting to plant anything in your container, give it a good scrubbing inside with clear water and then thoroughly rinse it out. On no account use detergent for cleaning, as it is difficult to be sure when all traces have been removed. In tanks or sinks where algae or slimes have become established on the sides and it is felt that water alone is insufficient, the addition of enough potassium permanganate to turn the water a violet colour will usually have the desired effect.

When the container is absolutely clean, spread about three inches of good clean garden soil over the bottom. Avoid getting any old leaves, pieces of turf or weeds in the compost as these will decompose and eventually contaminate the water, as will soil that has been recently dressed with artificial fertiliser. Make the soil into a muddy consistency by adding a little water, and you are ready for planting.

This can be done at any time between March and September. Choose a miniature waterlily such as the yellow *Nymphaea pygmaea Helvola* or its white cousin *Nymphaea pygmaea Alba* as a centre-piece. Or the diminutive form of our native "brandy bottle" or "Yellow Pond Lily", *Nuphar minimum*. Around the edge

"Discarded wine and vinegar casks also make excellent small pools"

... says P. Swindells.

Typha minima, an attractive miniature form of the familiar "Bullrush" with tiny brown poker heads, or the slender powder-blue *Mimulus ringens* can be planted. The Water Forget-me-not, Cotton Grass, Bog Arum and Water Mint may also be tried, although the latter may need controlling towards the end of the season. Several bunches of one of the less vigorous varieties of oxygenating plants, such as Willow Moss, Water Starwort, or *Tilleana*, should be introduced to help keep the water clear, and a portion of the floating Fairy Moss or Frogbit added to provide some surface shade.

After planting, cover the whole of the soil surface with a thin layer of gravel or pea-shingle (not collected from the sea-side). Place the end of the hose-pipe used for filling into a polythene bag on the bottom of the pool, and switch the water on. By using the polythene bag in this way, any turbulence likely to stir up the mud and gravel is eliminated, and the water remains nice and clear.

Add the floating plants, half a dozen ramshorn snails, and two or three small goldfish and the pool is complete. Routine maintenance is exactly the same as for an ordinary garden pond, although I prefer to remove the fish to warmer quarters for the winter months, as I feel it is unfair to leave them subjected to icy conditions in such a small volume of water.

Elodea densa

by B. Fry

ONE OF THE MOST USEFUL plants I know and grow is *Elodea-Egeria densa*. It is native to the Argentine Republic and northwards to Florida, and is quite suited to a coldwater or tropical tank. As a garden pond plant, however, it is seldom winter-hardy, except in climatically favoured parts of the country.

The pale green to dark green translucent leaves, like narrow and pointed ribbons, grow in close whorls of three or four (exceptionally five) along the everlastingly branching stems. And it is interesting to note, too, that in a spacious aquarium these splendid plumes of delicate green can reach a length of several feet.

Nothing special in the way of water (pH and so forth) or compost is called for, but it is important to give *elodea* at least nine hours a day of reasonably bright to bright light, and if the stems tend to become leggy it is a good plan to cut them back drastically. This treatment will promote a strong new growth.

As a plant for the beginner, this long-leaved *elodea* has no equal; for apart from its attractive appearance and accommodating qualities, any piece of stem will root freely, and the production of a dense forest or tangle of greenery is never long delayed. The advantages of this are considerable. First and foremost, the assimilation of nutrients in the water and from the detritus (both roots and leaves work hard at this) leaves little or nothing for algae to feed on. Moreover, algae—except for a few specialized types—will find it difficult to prosper when a flourishing higher plant blocks out a lot of the light. Secondly, as *elodea* is one of the cheapest of aquarium plants to be had from a dealer, and is so easily propagated, there is no need to fret when the time arrives to clear sufficient of it out to make room for cryptocorynes and other choice things.

WHAT IS YOUR OPINION?

by B. Whiteside

OUR FIRST LETTER comes from Mr. B. Green, of Dundonald, Belfast, and he writes on the subject of cold water fish-keeping, in answer to some questions raised by former writers on the subject. Mr. Green writes: "Colour:—Has Mr. Forsyth ever seen a good shubunkin with its blue gold, brown, red and white, and all this speckled with dashes of black, and the fish about 7 in. long? There is more colour in a good shubunkin than a dozen tropicals together. Cost:—Mr. Forsyth, a good pair of show goldfish can cost from £50-£100, an average pair £10, or a Japanese koi, 24 in. long, full of colour £500 for one. Disease: Diseases of cold water fish, depending upon the ailment, can be treated by slowly raising the temperature 10°F, but not, as a rule, above 80°F, and then adding the remedy as for tropicals. To say that 10-1 cold water fish can die when disease strikes is utter nonsense. Variety:—Does Mr. Goodwin know that there are about 126 varieties of goldfish alone, not to mention lots of other cold water fish which can be kept; for example I have a pair of rudd myself." Mr. Green goes on:—"It may be worth mentioning that a lot of so called tropical fish are in fact temperate water fish and can be kept at room temperature and in some cases, along with goldfish. So have a look in your 'tropical' tank and see how many 'tropical' fish you have. A few examples of temperate water fish (i.e. 65-75°F) are Australian rainbows, flag fish, some barbs eg. Ticto and Schurbertie, blood fins, white clouds, and even Mr. Goodwin's beloved guppies, to mention but a few. Mr. Goodwin seems to get excited over a pair of guppies breeding. Did he ever try to stop a pair of guppies breeding? I think that this would be more of an achievement, without separating them! This brings me to a point which really makes me angry. Does Mr. Goodwin

suggest that goldfish do not require a proper tank and equipment? Nonsense, of course they do Mr. Goodwin. I could get very cross here, but instead I will count to ten. Somebody suggested that coldwater plants do not flourish too well (Mr. Goodwin again!) Rubbish! In my own tanks at home I have plants which flourish so well that I have frequently to thin them out. One of my tanks 51 in. x 15 in. x 15 in. has the following plants well established:—Cabomba, Amazon sword, Vallis., Ludwigia, willow moss chain sword, Sagittaria and a few more so-called tropical plants whose names I can't remember. The tank is lighted about fifteen hours per day with a 4 ft., 40 watt warm, white tube. The temperature of the tank is about 68-70°F and very rarely, if ever, falls below 65°F. Oxygen requirement:—(Mr. Highman) I have my tanks fitted with the under gravel system of filters, and this provides enough oxygen to keep the fish happy. It is important, as with tropical fish, not to overcrowd.

Breeders also, I think, could do a lot to raise the standard of cold water fish, in particular, goldfish. By reducing the cost of good fish, more people could afford to acquire good fish and in turn be able to breed a better class of fish. I hope that these few comments will stimulate thought all round and in particular amongst the dealers and breeders".

Master Joseph Heyberg, of Colindale, London, is 15 years old. He feeds his white worms on a sloppy mush of bread and milk. He keeps them in a plastic kitchen container which can be bought anywhere for a few shillings. It has a transparent top. This contains topsoil and humus, and is kept on a window sill. His aquarium contains plastic plants, the brilliant colours of which are heightened by using granite as the rockwork. He intends to us "Gro-Lux" lighting when he can afford it. The tank stays clear by the use of under-gravel and outside filters. In the case of an incurably sick, large fish, Master Heyberg would net it, hold it by its tail with a dry cloth (to prevent it slipping) and bang its head hard on a firm surface. If the fish were small, he would drop it into a 5% formalin solution.

Master M. J. Shaw, of Sowerby Bridge, Yorkshire, is also 15 years old. On the question of sick fish, he says



that some aquarists dispose of them down the lavatory basin. He thinks this method to be extremely cruel as death is slow and lingering. Others drop the fish into boiling water. He thinks that this method is better than the former but points out that the fish are momentarily scalded before death. To Master Shaw, the ideal method is to drop the fish into a quart of water containing 1 grain of sodium amylal (used in some sleeping and tranquillising tablets). The fish is painlessly anaesthetised, and while insensible, can be picked out and smashed with full force on the floor. If an anaesthetic is not available, the fish can still be hurled on the ground.

Mr. Derek A. Bayne, of St. Andrews, Scotland, bought a culture of white worms about nine months ago. He put them into a 6 in. x 6 in. x 2 in. box, made of transparent plastic, and filled with peaty earth. The box has been kept in a wide range of temperatures in different cupboards, normally in the dark. The worms are fed on hard, white bread, soaked in milk, and the compost has been damped once per week. He has found this method very successful and it regularly supplies a decent supply of worms. The box is always uncovered and the worms are removed with tweezers. On the question of artificial decorations, Mr. Bayne has mixed feelings. He dislikes truly artificial ones. The nearest he has come to using them in his tank is the inclusion of rock strata formations which, he thinks, look very well if arranged properly. Volcanoes, clams, sunken galleons etc. cheapen the aquarium, as well as spoiling its natural beauty. Mr. Bayne looks forward to other people's ideas on rogue or sick fish and always learns the maximum size to which a fish will grow before he purchases it.

Mr. G. C. Noble, of Gravesend, Kent, keeps his white worms in a plastic seed tray, about 1½ in. in depth. The compost consists of about equal parts of garden soil and peat, kept moist with aquarium

water. The tray is covered with a sheet of glass topped with brown paper. The culture is kept in his cellar. Food consists of moist bread, biscuit, cake or pastry, or cooked potatoes, cabbage, peas, broccoli, swede or turnip. The results are fantastic in worm quantities. He does not have any artificial decorations in his aquarium. He strives to make his furnished aquaria look like a section of stream or river bed. Artificial plants to him detract from the appearance of the tank, apart from any damage caused to the mouths of fish who may try to browse on them. Divers and such like look out of place in an aquarium. If Mr. Noble had a large rogue fish which killed its tank mates, he would not hesitate to kill it, the attitude being one against the many, the many winning every time. He would dispose of it by throwing it down on a hard surface, a method which he uses to dispose of all his unwanted or incurably sick fish.

The pendulum seems to have swung in the opposite direction on the question of coldwater versus tropical fish, and would seem to show that there are still many keen coldwater fish keepers. Fortunately our hobby leaves plenty of room for both sides. I like Master Shaw's idea of anaesthetising an ill fish before killing it, and Mr. Noble's idea of giving white worms a good mixed diet, rather than just one regular kind of food. I also admit that plastic ornaments are not for me, although plastic plants would certainly have their uses in specific instances.

We would like to have your opinion on the following questions, and request that you print your name clearly on your letter. (1) What, in your opinion, is the cause of split fins in guppies? Have you found any 'cure' for split fins? (2) What is the effect of 'the growing action of rust' in a reinforced concrete pond? Is reinforcement a job for experts only? (from Mr. G. Noble). (3) Let us have your experiences of aquarium plants which have flowered. Have you managed to raise any young plants from home produced seeds? (4) What conditions have you found most suitable for growing: (a) Vallisneria, and (b) Water wistaria? (5) Have you any good, original ideas for entertaining items to be included in an evening meeting of an aquarists' society?

HOME MADE FISH FOODS

by W. W. Bowman

VERY GOOD FISH FOODS can be made by the following method using tinned and dried baby foods on sale in chemists and grocers.

Creamed spinach, egg and fish, and beef and liver soup are among the tinned varieties available and suitable, and among the dried varieties, cheese and cauliflower, liver and vegetable, and beef with vegetable, also Farlenc and Bemax.

All these can be mixed to a thin paste and spread over a tin lid or sheet of tin, etc., and slowly dried in an oven or over a small oil stove or anything else that will dry the paste slowly.

If a fine flake food is required suitable for fry, the paste should be made very thin with warm water and spread thinly on the tin dish; this will soon dry so it should not be left too long. When dry it can be crushed in the hand and sieved if desired.

A thicker, large grained food can be obtained by the same process, making a thicker paste by the addition of ground and sieved oatmeal or breakfast cereal; this when dried can be ground and sifted through a large holed sieve or even a tin with suitable sized holes put in with a small nail.

This may sound like a lot of work but a large amount of food can be made in a couple of hours, enough food to last for about a month.

Most of this baby food can of course be used without any treatment whatever for fish of $\frac{1}{4}$ inch to 2 inches body length; the dried baby food can be used straight from the packet and if not fed excessively will not foul the bottom.

The tinned spinach is very necessary in the winter months when fish that require algae in the diet cannot get sufficient. This applies particularly to Mollies and other livebearers, also to Cichlids and *Tilapia*.

Another good winter food is boiled peas and beans; these should be crushed in the fingers trying to keep

the skin out if possible. Peas and beans will be eaten with relish by nearly all fish and large Cichlids will swallow them whole.

Boiled, or even fried, fish that is not too greasy is also a good suitable food; scraps left from the table can be used if no vinegar or sauce has been added.

All these foods should be given in rotation as lack of variety is the cause of fish losing their appetite. The home made foods should not, of course, be all mixed up together but one tinned food mixed with one dried and then another two different ones and so on, and when dried kept in different boxes and fed to the fish on different days. Another good household food is scrambled egg. This, again, should be watched for any condiments or sauces if table scraps are used.

OVER 100 ENTRIES EXPECTED IN BRADFORD AQUARIUM EXHIBITION

Many special attractions

THE 2ND NATIONAL FURNISHED Aquarium Exhibition is expected to be even larger than the 1966 Yorkshire. Competition entries are being received from enthusiasts all over the country, who will be competing for cash prizes totalling £200.

In addition to competition entries, which will remain, after judging, as part of the Exhibition, there will be many special attractions on show, including a tank of large marine tropical fish, a water garden display and several tanks exhibiting many exciting, weird and unusual fish and many interesting trade stands, including a large "King British" stand exhibiting the new range of aquarium cures and equipment.

The Exhibition, sponsored by K.B. Tropical Fish of Bradford, will be held at St. George's Hall, Bradford, from 18th to 22nd June inclusive. Parties from Aquarists' Societies will be welcomed.

BREEDING GOLDFISH

GROWING ON THE YOUNGSTERS

by A. Boarder

MY PREVIOUS ARTICLES on breeding goldfish have dealt with the procedure up to the hatching of the fry and feeding for up to a month old. From now on everything should go well providing certain basic rules are adhered to. It may be repetition on my part but these rules are worth repeating as they are absolutely essential if successful breeding and rearing are to be attained. These rules are:—Space, warmth, oxygen and food. With the lack of any of these points success will not be gained. I know that it is possible to rear fish with one or more of the elements missing but it is certain that growth will be restricted if nothing more serious happens.

Providing everything has been supplied as to the rules it is probable that the young fish will be about three-quarters of an inch in length and be taking various kinds of food. Be very careful from now on with the amounts of food given. Just because the fish appear to take the food which is offered this does not mean that you have to give lots more. If you have the water temperature between 65°F and 70°F, any uneaten food will soon pollute the water. Once the water is foul the fish will go off their food, just one day of impure water can mean that the fish will not feed and if the usual quantity of food is given the water will become not only impure but positively dangerous. If such a condition arises it is imperative to change most of the water. When this has to be done do not on any account give any food, but wait at least a full day. The fish will then be in the right condition to start feeding again, and from then on feed sparingly. It is amazing how long goldfish can go without being artificially fed. If there are plenty of water plants in the tank then the young fish will browse around them and find small

types of food, both vegetable and animal. If the water is rather green with free-floating Algae, the fish will eat plenty of this, but I do not like tank water to get too green so that one can hardly see through it. When this happens, usually through too much light, a sudden change in the condition of the water can mean that some of this Algae can die and then pollute the water.

Now that the young fish are making good progress it is essential to see that they have sufficient swimming space to ensure that they keep growing on well. It will be found that it is much easier and safer to move the fish once they are about an inch in length. They do not appear to be as susceptible to the changed conditions at this stage as they were when very tiny. Make sure that the water in the new tank is in good condition. Do not use tap water and put the fish straight in to it. Wait at least a full day before doing so and if you have some water plants in the tank you will find this an advantage. The plants appear to assist the water in maturing somewhat. Fresh tap water may contain a quantity of chloride of lime, and this could harm very young fish. The temperature of the water is also rather important. I have advised that it is better to raise the young goldfish, especially if they are of any of the fancy varieties, in warm water. A temperature of 65-70°F, is a very good one for the young fish as they will eat more and grow far more quickly than if the water is on the cool side. As a rough guide I consider that the fish will grow twice as fast in this temperature than one of 50-55°F. One must always realise though that the less the water, the less oxygen does it contain and so, if there are a good number of fish in a tank warmed to 65-70°F, then aeration must be used. The aeration is also essential if there are a lot of fish in the tank.

Aeration need not be violent, just a few bubbles rising to the surface can not only provide extra oxygen immediately but the rising bubbles will cause a slight movement of the water so that much of it will be brought up to the surface to get fresh oxygen and give off foul gases. If a heater is used to keep up the water temperature this will also make a good current of water from near the heater which continually moves currents up to the surface and then as it cools it will pass

down and more come to the top.

From now on the food can be varied considerably. It is surprising what a varied diet goldfish can take. They are omnivorous and so will eat both vegetable and animal matter. It is not so very important what kinds of dried foods are given but it will be found that a little live food every day or other day will benefit the fish. My own feeding methods do not vary much from year to year. I always use Liquifry for the first feed and then go on gradually to mashed white worm. The first dried food given is fine flake food. I use a very good make which I know from experience the fish will take. This food can be bought in a fine condition purposely for fry, but if one has the worm shredders this flake food can soon be reduced to a dust-like powder. This is lightly sprinkled on the surface and a feeding ring is not used at this early stage.

The white worm can be easily mashed up with the shredders but if garden worms are used care must be taken to see that either only very small worms are used or that the matter is sifted through a fine net to remove the coarse skin. The latter can be fed to the older fish. As the fry grow they will be taking larger food and the coarse shredders will then come in useful. If no form of live food is available it is still possible to rear the fry with dried foods only. In the early stages when the fry are being fed with Liquifry it is probable that plenty of infusoria will form in the tank and so the fry will get at least a little live food. As they grow so they will eat much of the fine Algae and particles of soft vegetation. I find that the best method for rearing the young fish is to use only Hornwort, *Ceratophyllum demersum*, so that there is no necessity for using any base compost at all. The plant in question makes no roots and so needs no base soil or compost. This makes the weekly cleaning an easy task. A siphon tube can be run over the bottom of the tank to remove any mulm and detritus which will surely collect there. Some water will of course be removed whilst this cleaning operation is taking place and this should be replaced with fresh water. This can be straight from the tap, as a small amount necessary to fill up the tank will soon mix with the existing water and become harmless.

ACCLIMATISATION

by G. W. Wright

THIS IS A TIME of the year when a few facts regarding the above might be of value to the coldwater fishkeeper, prospective fishkeepers and those thinking of constructing a pond in the garden. For many years I have bred, reared and had an interest in the breeding of shubunkins, both London and Bristol types.

At this time of the year it is fairly common to see in pet shops and dealers' tanks a large number of so-called coldwater fish of all types. Shubunkins, fantails, veiltails, comets, moors, orandas and hundreds of ordinary goldfish. Looking and browsing among the dealers' tanks, it is sometimes possible to see good examples of the various types. I have seen some good comets, calico fantails and veiltails and one can be tempted to go and buy if stocking a new pond or restocking an old one is contemplated. I have many times heard the same question asked of dealers. "Can I put these straight in the pond?" "Oh yes" is the usual answer. "Just stand the can in the water and let the temperature equalise and they will be all right". This, mind you, in the middle of March or April. Take April this year; out of the first fourteen nights we had twelve frosts in my district, and that is in the South East of England. I ask you, what chance do these fish stand when placed in the purchaser's pond? Thousands must be lost every year. They come, for the most part, from Italy, Japan, Hong Kong and Singapore and were reared in temperatures of 70°F plus. I know, I have seen them. It is obvious that they come from such temperatures, how else could such young fish have changed colour at such an early age? Suddenly, they are transported, purchased and placed in an outdoor pond in this country and in a very short time they are in dire trouble. The picture is always the same; they just sit motionless on the bottom and

every now and then one will lumber to the surface and then resettle on the bottom. In a few days they have white spot, fungus or some other indeterminate ailment and in about ten days the purchaser finds he or she has lost the whole lot. This is a sorry state of affairs and very bad for the hobby, as people tend to give up in disgust and lose interest altogether. I can only think they must be bought very cheaply by the dealers. However, with a little knowledge and understanding, success can be achieved instead of failure with these fish. If you see a good example of a particular type of coldwater fish be it fantail, comet, shubunkin or moor, buy it by all means and if you observe the following points all should be well. Do not place them in the pond outdoors until June. I have noticed for many years that not until June can we expect the temperature not to drop below 50°F at night and for some reason 50°F is the absolute minimum for these fish. I have noticed that so long as the temperature is not allowed to drop below 50°F they are all right, but below they are in trouble. I have taken the temperature at 8 o'clock in the morning in my pond every day in April and it is never above 40°F. It has even been as low as 38°F. So you see, these fish must be put in aquariums indoors either at living room temperature or with a heater and thermostat placed in the tank and arranged so that the temperature is in the range of 55°F to 65°F. A temperature of 60°F should be aimed at, and all the other requirements of coldwater fish should be observed, such as plenty of space, no overcrowding, good water and, last but not least, live food only; garden worms, tubifex, white worms and no dried food at all. The reason for this is that they have never had any before; the water in which they were hatched and reared teems with daphnia and other live food naturally.

This is another reason besides the warmth why they make good size and colour at an early age. I repeat again, what are their chances? Plunged into water 30°F lower than they are used to with a new owner who attempts to feed them with biscuit-type goldfish food?

One day about the first week in June it will be found that the temperature of the water in the garden pond is touching 70°F and if the temperature is taken early in the morning it will be found to be about 60°F, that is about an eight or ten degrees drop overnight. This is the time when the fish can be safely placed in the pond without any trouble, and I have found they can also go through the next winter all right. The six months they spend in the pond before the severe weather sets in is enough to complete the process of successful acclimatisation.

FIND THE FISH

by Doreen Thiel

The first is in MINUS and also in PLUS
The second is in CAT but not found in PUSS
The third is in SILVER and also in GOLD
The fourth is in MODERN but not in OLD
The fifth is in FLORIN and also in CROWN
The sixth is in GRIN and also in FROWN
The seventh is in SWORDTAIL but not in MOLLIE
The eighth is in IVY but not found in HOLLY
The ninth is in SUET but not in LARD
The tenth is in SCORCHED and also in CHARRED
The eleventh is in BUTTERCUP but not in DAISY
The last is in ESTHER, SHIRLEY and MAISIE.

answer on page 77

HURRY WITH THOSE ENTRIES FOR THE BIG

FISHKEEPING EXHIBITION

Closing date for entries
15th June

Entries for the "Aquarist and Pondkeeper" Fishkeeping Exhibition in July have been streaming in from all corners of the country, and no doubt there will be many more before entries close on June 15th. If you plan to be more than a spectator at this exciting event, may we remind you that time is running out but not so quickly as to close the door on your entry if you *act promptly*. Show schedules can still be obtained, completed, and returned before the closing date; write to:

**Mr. S. Mooney, Show Secretary,
44 Consiston Road, Muswell Hill,
London, N10.**

As the busy weeks pass and the tempo of organisation increases it has become clear that interest in the Exhibition has gone wide and deep. The response, in the way of entries, enquiries and bookings, has come in encouraging volume, and at recent meetings of the Federation of British Aquatic Societies, who are co-operating with the sponsors, there has been much favourable comment on the all-round interest in the Exhibition and of the shape it is taking. Everything points to a big competition entry, a comprehensive trade section, a feast of original ideas in society exhibits, and "full house" attendances.

Junior Class suggested

Suggestions from aquarist societies indicate keen interest in a class covering "Society Junior Furnished Aquaria", and if sufficient entries are received an appropriate class will be included. Those wishing to enter should complete the entry form in the



Alexandra Palace and Park, photo. Aerofilm Ltd.

Show Schedule, and also supply the entrants' names, ages, and school attended. Entries for this class must come from two or three "Junior Society" members under the age of 16 at the time of the Show. The equipment supplied will be as for the other junior sections, i.e., 18 in. x 10 in. x 10 in. tank, lighting and heating.

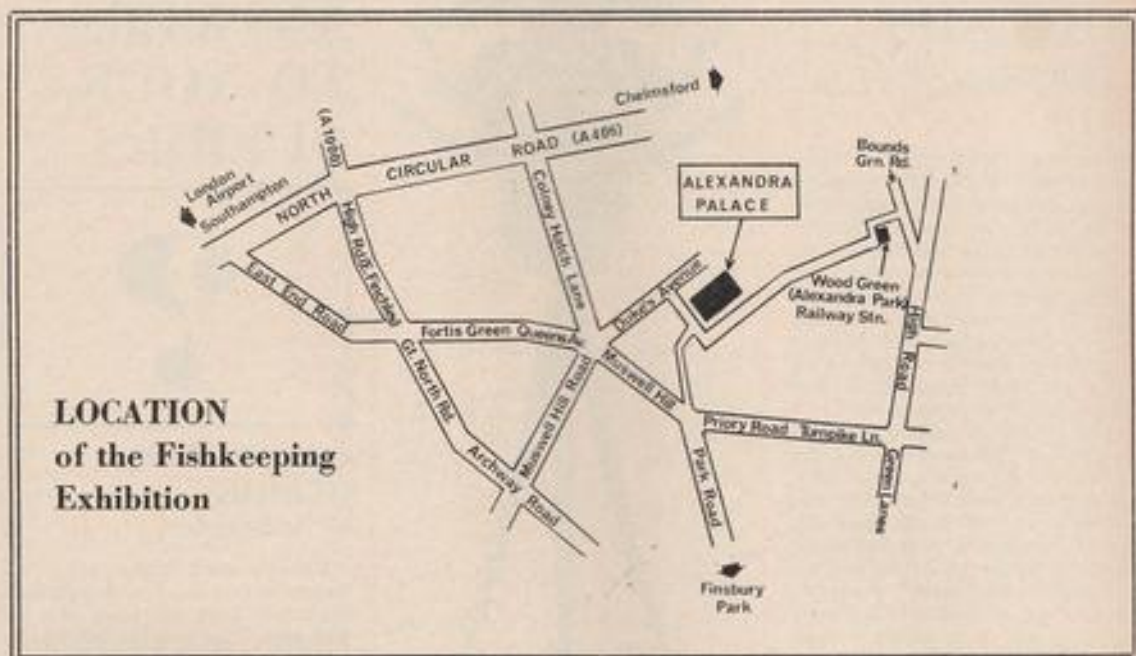
Apart from the society juniors it is anticipated that youth will be strongly represented in the class for Schools Furnished Aquaria. Details have been sent, together with an invitation, to over a hundred schools in the Greater London area and should produce some keen competition.

Parkland setting

Alexandra Palace, that famous landmark on the heights at Wood Green, has the big advantage of offering ample space in its 280 acres of grounds together with ease of

access by road, rail or bus. Away from the congestion of central London it affords plenty of free parking space for road travellers, frequent services by public transport, and the added attraction of a family outing shared between the Exhibition and the surrounding parkland. The accompanying plan shows the location, with details of routes and services.

Opening on Thursday, 10th July and continuing to Sunday, the 13th, the "Aquarist and Pondkeeper" Fishkeeping Exhibition will provide the most comprehensive display to be seen in the south for many years. The competitive classes alone, with their accent on furnished aquaria, will offer the widest interest to established aquarists and an eye-catching spectacle to the uninitiated. Society entries have a reputation for producing the unusual, and there is high promise of some really original entries at Alexandra Palace. Other



special displays and set pieces are being provided for and should serve to illustrate the variety of applications to which aquaria and water gardens can be put in achieving novel and pleasing effects. The trade exhibits will in themselves be worth a visit to the Exhibition, and will include the latest equipment and accessories as well as species of fish not usually seen on these occasions.

Special concessions on admission charges will be available to parties numbering 25 and over, i.e., 3s. per head, and application for these party tickets should be sent to the Show Organiser, The Aquarist and Pond-keeper, The Butts, Half Acre, Brentford, Middlesex. The Show Organiser will also be pleased to hear from enthusiasts who wish to publicise the Exhibition by displaying car stickers, handbills, and posters.

Just a final reminder to get those entries in before June 15th. With all

their responsibilities for planning, publicising and equipping the show, the organisers would still be disappointed if your good intentions to be "in the hunt" were frustrated by forgetting to enter. It's going to be a grand show—be in—and be there!

How to get to Alexandra Palace

BY TRAIN. From any of the Main line railway stations take the underground tube train to Finsbury Park from where buses W3 or W5 run to Alexandra Palace, or Piccadilly Underground line to Wood Green Station.

BY BUS. Routes to Finsbury Park, 4A, 19, 29, 39, 106, 127, 168A, 221, 236, 253, 259, 379 and Green Line Coaches 715, 715A, 718 from where buses W3 or W5 run to Alexandra Palace. Other routes to Wood Green are buses, W4, W6, 29, 123, 141, 221, 243, 298, 298A and Green Line Coach 715.

BY CAR. From North of London: Follow A1000 over the North Circular Road (A406), turn left into Fortis Green and Queen's Avenue. Turn left at the bottom of Muswell Hill into Alexandra Park. From South London: Take Stroud Green Road from Finsbury Park and follow road into Crouch Hill. Turn right at the bottom of Crouch Hill into Crouch End Broadway, then left into Park Road and Alexandra Park. From the West or East of London: Take the North Circular Road (A406) and follow directions as from the North of London.

**ANSWER
TO FIND THE
FISH
Salmon discus**

WATERLIFE PESTS AND FRIENDS

by Bill Simms

DESPITE THE FACT THAT we name insects mainly in the adult form—for to us this seems only logical—there is no doubt that from the insects' point of view a case could be made out for thinking of the larval, growing and feeding stage, as the most important one. In many cases this larval stage lasts very much longer than the adult stage; and in the case of mayfly larvae these live many hundreds of times longer than do the adults.

Not all Mayfly adults die within one day of the metamorphosis, for there are some that live for 2-3 days, and an occasional female that may last for about 2 weeks. However, it is a very short period compared to the year of life of the larval form, and it is not made any more acceptable because the adult mayfly has such weak legs that it can hardly walk on them, while its mouth-parts are not developed sufficiently for it to eat food.

In contrast the larvae are very much alive and active. This present species belonging to the *Ecdyonurus* genera, is a perfect example of adaptation to its environment. It lives in fairly fast-moving streams where it scuttles about the bottom under and around stones. Its body is flattened so that it offers very little resistance to the water. These *Ecdyonurus* larvae have had to acquire more agile habits than other species because of the fast-moving water that could easily sweep them away and so they can run forward or sideways just as easily as does a crab.

The food of these mayfly larvae is organic mud particles and the algae that coats the stones and water-plants. Usually the main feeding is done at night, for the mayfly larvae in these fast-running streams—that are normally clear—prefer to skulk under stones during the daytime to avoid light as much as possible.

The adult mayfly of this species does not drop her eggs into the water



like most others do, but climbs down a plant stem and attaches her eggs just below the water line. There can be anything from a few hundreds to many thousands, according to the species. The tiny larvae hatch out quickly and then go through a number of similar larval stages as they grow. The present species reach about $\frac{1}{4}$ an inch when fully grown and then show the marks of wings on their backs. Also, after the first larval stage, gills are acquired to enable the larvae to breathe more efficiently. These are flattened plates that lie along each side of the abdomen. It is with the varied shapes of these gills that some species can be recognised when in the larval state. When fully grown the larvae creeps up to the surface and there hatches into the sub-imago. Then it splits open once more to reveal the perfect mayfly—with a life of hours only.

OUR EXPERTS' ANSWERS TO YOUR QUERIES



COLDWATER QUERIES

by A. Boarder

I have been trying to get some Nylon netting to cover my garden pond but have not been able to find any. Can you tell me where I could get some please?

Many shops dealing in "Do it yourself" equipment sell such material but if you have difficulty try writing to Transatlantic Plastics Ltd. (Dept. D.M.L.85), at 29 Victoria Road, Surbiton, Surrey.

I have some White Spot in my goldfish tank. I read that if the parasites find no fish to attach themselves to they soon die. How long does this take?

The time taken for the development of the parasite depends on the warmth of the water. Once the parasite leaves the fish to encyst on the bottom it will take about four days to ripen and allow fresh young parasites to emerge at a temperature of 65°-70°F. If the water is cooler, say 50°F., it could take up to a month. One sure way of ridding fish of this trouble is to warm the water to 70°-75°F., to hasten the development of the pests whilst still on the fish and then to change the fish to a clean sterilised tank every day. This will wash away all the cysts before they have a chance of releasing more

fish, not counting the tail. Some people keep one or two Bitterling which do not grow very big, but most other fresh water fish could soon grow too large for your tank. Minnows are small but they prefer running water and might not live long in your tank. I suggest that you stick to small fish of the goldfish varieties.

TROPICAL QUERIES

I have been told that acid water can be hard. Is this correct?

Yes, if the water contains a lot of minerals. Soft water is water lacking calcium and other hardening salts. Distilled water, for instance, is truly soft water; so is snow water and rainwater. Soft water passed through peat will give you soft water with an acid reaction. If you added drops of hydrochloric acid or peatwater to hard tapwater all you would get would be hardwater giving an acid reaction.

I am a beginner and was advised by my dealer to feed live-food because then, he said, there would be no danger of my polluting the water. I have been feeding *Daphnia* and whiteworms. But now the compost has turned blackish and there is a sort of mould spreading over it. Also, the fish keep rising to the surface. Please tell me where I have gone wrong?

You will have to clean out your aquarium without delay. You have fed more of the worms than the fishes have been able to cope with, and these unclean worms have worked into the compost, died there, and brought about a state of acute pollution. It is quite as easy to turn water bad with too much livefood such as worms, that will die in the sand, as with too much dried food left to decay on the top.

I should like to know whether *Danio malabaricus* can be bred in a 2 ft. tank and what set up is necessary.

The giant danio spawns during wild rushes up and down the length of the aquarium. The male is a vigorous driver. A 24 in. by 12 in. by 12 in. tank will prove quite suitable, provided the bottom is covered with well-washed pebbles over which it is

advisable to anchor some bunches of myriophyllum or willow moss. After egg-laying is over, remove the cannibalistic parent fish from the tank.

I have seen a 4-in. catfish in a dealer's tank. It is called *Schilbe marmoratus*. I would like to introduce it into my community tank stocked with medium sized barbs and larger characins, but it looks terribly aggressive though my dealer says it is as harmless as a lamb. Can you help me to make up my mind?

Schilbe marmoratus is not a spiteful species but it has two failings: it hides away from the light, and it sometimes exceeds 6 in. in length.

I should like to know whether a pair of *Aplochelichthys daysi* would attack the other fishes in my community tank? Also, is *A. daysi* a ready-breeder?

This attractively coloured killifish is not aggressive, but it is advisable to give a pair a tank to themselves. The fish lives and breeds best in a soft and acid water maintained at a temperature of about 75°F (24°C).

What size tank is needed for keeping an arowana?

As large as can be accommodated in your home. Depth of water is not very important, for the fish keeps near the surface. What is important, however, is to see that the aquarium is kept well covered, for the fish is an accomplished leaper.

Is it true that *Vallisneria* can stand an extraordinary wide range of temperature?

Vallisneria spiralis, the best-known species, will stand a range of temperature from the lower forties to the nineties (°F). But there are other vallisnerias indigenous to the warmer parts of America and Asia that are only suited to a tropical aquarium.

I cannot keep a corydoras catfish in my aquarium for more than a month or two, yet the other fishes, mainly tetras, live on for a long time. Please could you give me any reason why the catfish always die?

It could be that the water is not suitable. Tetras live longest in water that is soft and acid; corydoras, on the other hand, flourish best in water that

is a trifle hard and neutral to alkaline. Again, it is not an uncommon thing for catfish to be deprived of food when placed in a community tank. You see, most catfish are most active when the light is fading or after dark. So, when you introduce food, alive or dried, into a lighted aquarium the fishes swimming in the middle to upper layers gobble it up before it reaches the bottom. The way to get around this problem is to introduce food a few seconds before the light is switched off, or just before dark.

Would you recommend snails as scavengers in the tropical aquarium?

The short answer is no. But on the other hand, if you keep fishes that will nibble at the egg-capsules and so keep the snail population in check, then it is true to say that some snails do help to keep the bottom clear of uneaten fish food. Further, the excreta of snails provides nourishment for the plants.

Is a 1/2-in. thick glass strong enough to support the combined weight of water, sand and rocks in a 36 in. by 15 in. by 12 in. tank?

It should be, provided the glass is bedded on a level cushion of well-kneaded cement. But a wired glass of similar thickness would give greater strength.

I should like to know the name of a *cryptocoryne* that is really easy to grow and will multiply rapidly in sand alone.

Your best choice would be *C. affinis*—*haerteliana*. But *C. wendtii* is another member of this wonderful genus that may be grown without difficulty.

What species of fish (scientific name, please) is a Congo salmon?

Phenacogaster interruptus, sometimes called *Micralestes interruptus*, is often referred to as the kongo-salmer in Germany. Perhaps it is superfluous to add that the species is native to the Congo.

Is there such a livebearer as a dwarf swordtail?

If you mean a species of *Xiphophorus* smaller than *X. helleri*, then the fish that fits this title best is the little-known *X. pygmaeus*, which was first made known to science in 1943.

fish, not counting the tail. Some people keep one or two Bitterling which do not grow very big, but most other fresh water fish could soon grow too large for your tank. Minnows are small but they prefer running water and might not live long in your tank. I suggest that you stick to small fish of the goldfish varieties.

TROPICAL QUERIES

I have been told that acid water can be hard. Is this correct?

Yes, if the water contains a lot of minerals. Soft water is water lacking calcium and other hardening salts. Distilled water, for instance, is truly soft water; so is snow water and rainwater. Soft water passed through peat will give you soft water with an acid reaction. If you added drops of hydrochloric acid or peatwater to hard tapwater all you would get would be hardwater giving an acid reaction.

I am a beginner and was advised by my dealer to feed live-food because then, he said, there would be no danger of my polluting the water. I have been feeding *Daphnia* and whiteworms. But now the compost has turned blackish and there is a sort of mould spreading over it. Also, the fish keep rising to the surface. Please tell me where I have gone wrong?

You will have to clean out your aquarium without delay. You have fed more of the worms than the fishes have been able to cope with, and these uneaten worms have worked into the compost, died there, and brought about a state of acute pollution. It is quite as easy to turn water bad with too much livefood such as worms, that will die in the sand, as with too much dried food left to decay on the top.

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UNDER THE INFLUENCE OF LIGHT

by Stanley Fox

WHILE IT CAN BE argued by aquarists that it isn't necessary to possess any scientific knowledge pertaining to fishkeeping and tropical plant growing to have success in both of these facets of our hobby, nonetheless it is of help to the hobbyist, if he does possess some knowledge of what influences the growth and well-being of plants, fish, and associate benevolent life-forms within the aquaria. Therefore, the following points may be of some interest.

Plants respond to light of various intensities in the following way; if the light source is too intense the plants will react by turning the Chloroplasts within the green cells so as to present their edges to the light, thus seeking to avoid damage to the Chlorophyll. When the light source is favourable, the 'faces' of the Chloroplasts are presented to the light so as to gain maximum benefit.

Floating algae also possess a similar characteristic; in this instance the algae possess a flagella thus enabling the cell to move about. Situated within the algae cell is a pigment or eye-spot; this spot reacts under the influence of light and by this means the algae is attracted towards the light; when the light, as the algae approaches nearer, becomes too intense, the algae will immediately move away to a more congenial position where algae can undertake the assimilation of light without damage to the Chlorophyll. This is the main reason for the constant movement of floating algae, though other factors do stimulate their desire or need to move about.

These plant movements *towards* light sources are termed positive phototactic movements.

Their movements *away* from light are known as negative phototactic movements.

It is recognised that poor light conditions are responsible for poor

plant growth, degenerate plant tissues, leaves turning yellow, but poor lighting and moderate lighting should not be confused one with the other. Of equal importance to plants is quality of light and duration of exposure to light.

Tropical water-plants absorb no more than approximately 3-4% of the total light energy that they are exposed to, energy derived from absorbing light from the blue and red bands of the spectrum. Plants can best absorb their quota of light over what is called a 'long day' of ten hours or more duration under moderate light conditions. This will promote healthy plant growth while ensuring the minimum of algae growth; as plants (as previously stated) only absorb a low percentage of light at any given time from the total amount presented to them, it seems pointless to use high intensity lighting on normal depth aquaria.

All this type of lighting can ensure is an unwanted, plentiful supply of green algae; when used in conjunction with poor water conditions blue-green algae is the result.

Tanks with a depth of 18 inches or more need to have an increased light source; but not too high.

Water clarity; obviously this is important, for light cannot perform its function under dull or cloudy water conditions (are your water conditions healthy and clear, as you think they are?).

Poor plant growth, leaves turning yellow, etc., etc., can also be caused by iron deficiency. Chlorophyll can only exist in plants when iron is present in the water, although the iron does not enter into the Chlorophyll.

Nutritional deficiency must be regarded as of great importance and overcome to ensure successful plant growth.

Although poor light and iron deficiency are separate causes of what looks like identical results, yellow leaves, etc., there are some differences; in the latter instance, yellowing of the plant leaves is most often accompanied by the formation of small spots, dark brown in colour, that appear on and within the leaf tissues. These become progressively larger in extent, until the plant leaves rot away; on occasion the edges of the leaves turn brown then spread to the central region of the leaf tissues; this is termed a chlorotic effect.

Brown Algae

Mr. Noel Gray (March issue) expresses the opinion that brown algae is perhaps an early stage of green algae that has died due to a decrease of light; secondly, he suggests that the introduction of an algae killing agent such as Potassium permanganate could cause this condition of brown algae. In answer I can only state; first, green algae cannot turn into brown algae; they are quite two distinct types. Whatever causes the destruction of the Chlorophyll of green algae (be it a decrease in light or a chemical used) thus causing the green algae to turn brown and die, the fact remains that all that is present in the aquaria is *dead algae*.

BROWN ALGAE IS ALIVE IN CONDITIONS FAVOURABLE TO ITSELF.

As this type of algae possesses no Chlorophyll, it is perhaps difficult to visualize how light can influence its growth in any way, and yet it does, acting on the brown pigment (Xanthophyll).

There are other types of algae-like unicellular life-forms that possess brown pigmentation; these types under the action of photosynthesis produce oils and other substances.

AQUARIUM PLANT FERTILIZER REVIEW

SUREGROW "FLOURISH", is a British product manufactured by SCANCO Division, of Windsor, Berks. This liquid plant fertilizer comes in a plastic bottle and contains seven ingredients essential for balanced plant growth. It is used at a rate of three capfuls per five gallons of aquarium water and should be used every two weeks for balanced growth. It comes in two sizes at 3s. 9d. and 7s. 0d. I found that the product gave useful results, especially in newly planted aquaria or in tanks without a large fish population or without any under gravel feeding. B.W.

ALL GLASS TANKS

by D. Bevan

SINCE MY LETTER about all glass tanks I have been interested in the comments received about their construction from other correspondents, which have, without doubt, proved their complete validity.

I have made many of these tanks without a single failure and the same can be said of many friends who have copied my method of construction. Regarding M. M. Benn's letter, the use of jigs may be necessary to produce these tanks on a commercial basis, but I can assure those interested that they can be constructed quite easily by anyone who is reasonably handy, *without jigs*. I would agree that the glass should be cut square; however, as this is within the capability of any good glazier this should present no problem.

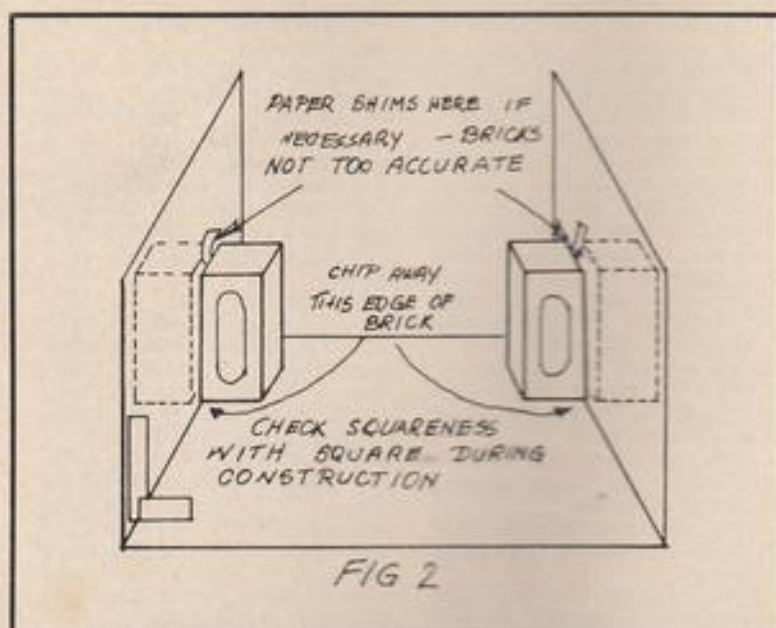
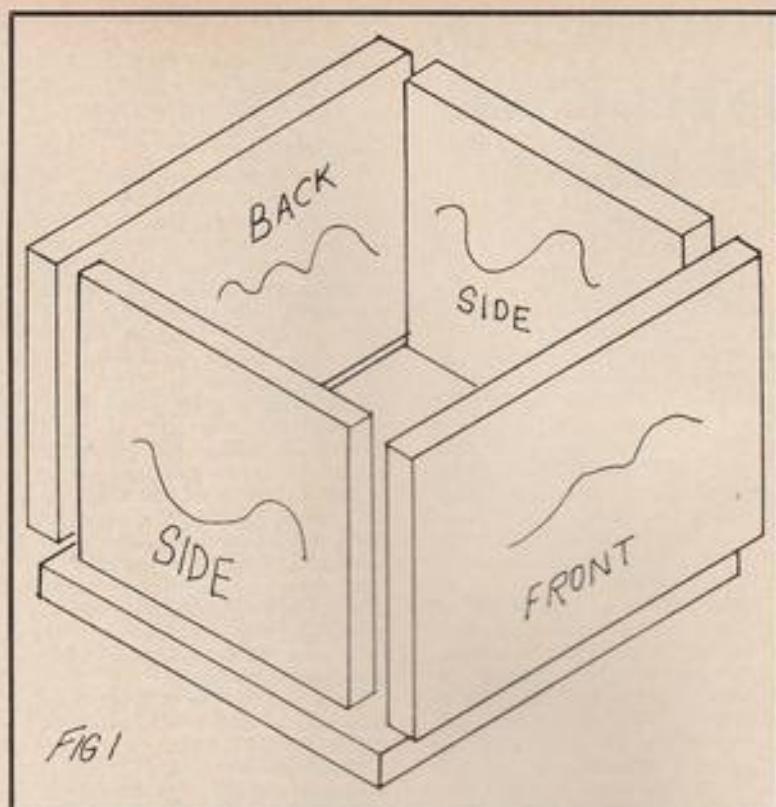
With regard to the 0.020 in. gap, I simply let the glass edges settle on to the base glass under their own weight—this presses out the sealant to the right thickness; providing there is a sealant film between the gap, its thickness matters little. Selotape can be used to hold the sides while the sealant hardens. A wide fillet around all inside seams then completes the job and gives tremendous strength.

I do not claim that this is the only method of construction but it is a very successful one.
SEE DIAGRAM

CORRECTION

With reference to my article "Gravel, Cryptocoryne Laetliana and Hardness," published in the April issue of *The Aquarist*, I would like to point out that the figure for the lime content of the silica compost under discussion should have read 0.08 per cent. and not 0.8 per cent. as printed.

R. C. MILLS.



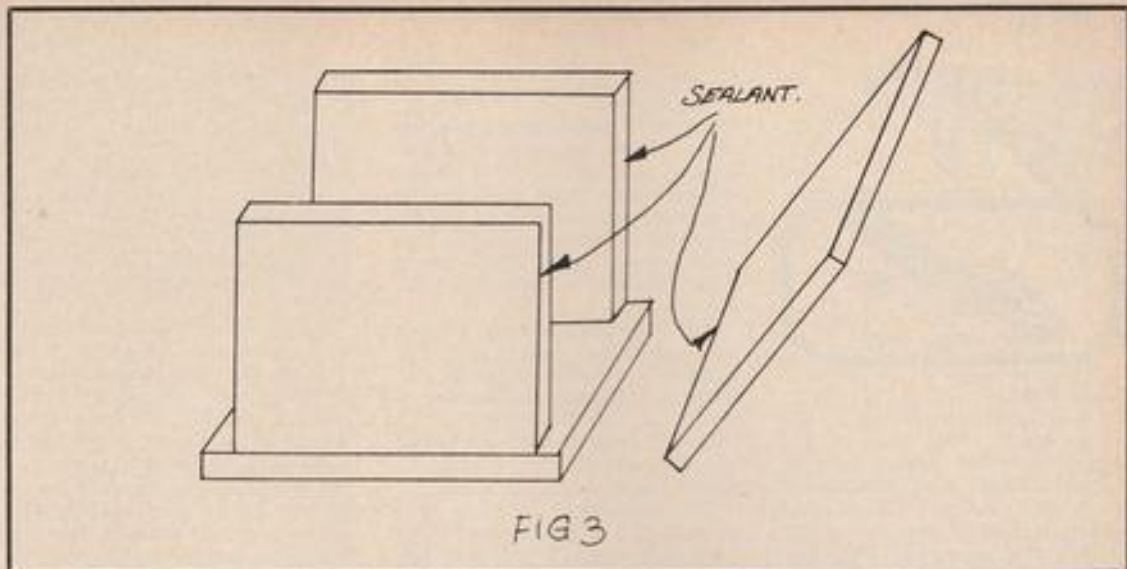


FIG 3

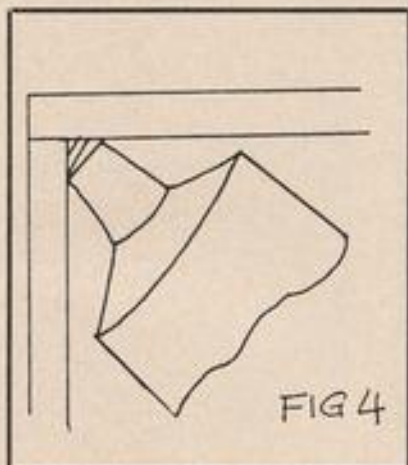


FIG 4

Made from $\frac{1}{4}$ in. plate glass bonding and sealing compound:—R.T.V.-108.

Edges to be bonded must be thoroughly cleaned using Carbon Tetrachloride or 'Thawpit' stain remover.

All sharp edges of glass ground off to prevent cuts.

Suggested size for first tank up to:—42 in. \times 15 in. \times 15 in.

Tank made in form of simple box (Fig. 1). Ends fit inside front and back, base made $\frac{1}{4}$ in. wider all round than assembled box.

Construction:—

(1) Glue bottom edge of sides, place in correct position on base (do this one at a time) and support with clean bricks (Fig. 2)—leave to set 24 hrs.

(2) Remove Bricks. Glue bottom edge of front glass. Glue upright

edges of sides (Fig. 3).

Holding front glass at an angle, place in position, bottom edge down first. When sure bottom edge is central with ends, push upright into position against sides—hold in position with selotape—leave 24 hrs—repeat for back glass—leave 24 hrs to set.

(3) Run a generous fillet straight from the tube round all inner seams (Fig. 4).

N.B.—Do not use new plate glass. Most first-class glaziers have salvage plate glass (old shopfronts, etc.) which is much cheaper. Locally in South Wales such glass costs only 3/6d per sq. ft.

CAUTION: Tanks must be placed on a firm, level base.

This is fatiguing but try to keep a reasonably uniform fillet.



OUR READERS WRITE



Spare Tanks

I have read the article on p. 728, of the March, 1969, issue of *The Aquarist*, referring to spare tanks for coldwater fishes. I am amazed that one would go to the trouble of cutting off the top of old hot water tanks when ordinary cold water tanks, with open tops are so readily available. Many of these can usually be found in builders' yards, or even at the roadside in some areas. Also why put three-quarters of an inch of concrete round the sides? I have in use a dozen cold water cisterns which I painted over inside with equal parts of sloppy cement and fine sharp sand. The pipe holes were first stopped up with plugs. I have a dozen such tanks still in use after over twenty years and they must have contained hundreds of young fantails at various times. At a fair estimate I consider that it did not cost five shillings to prepare the lot. One need not fill these tanks or one can half fill with brick-bats and float over to make them more shallow if necessary.

ARTHUR BOARDER

Back numbers of Aquarist required

I am interested in obtaining back issues from Volume 15 April 1950 to Volume 29, 1965.

I would be interested in trading on an even-Steven basis with any of your readers and offer the following volumes and issues of American Magazines which constitute my reserve sets. Perhaps a mention in your letter column would interest some British aquarist in swapping these volumes.

For Trade for an equal number and consecutive number of "The Aquarist"—"Aquarium Journal" 17 Volumes—12 Complete Consisting of Vol. 19, 22, and 25 through 34. Or 1948, 1951, and 1954 through 1963, 5 Volumes missing only, total of 10 issues in total.

"The Aquarium" 18 Vols. 1946 through 1963 complete except for two issues each missing in 1947 and 1957. 3 Vols Vol. 33-4 1964 issues missing—1965 complete—1966 last 2 issues missing.

"Tropical Fish Hobbyist" 14 Volumes—Complete Vol. 3, 4, 6, 7, 8, 9, 12, 13, 14—Total 9 Vols. Sept. 1952 through Aug 1966. Incomplete—Vol 1—1 issue missing. Vol 2—1 issue missing. Vol 5—1 issue missing. Vol 10—1 issue missing. Vol 11—2 issues missing. Total 6 issues.

STEVE STEWART, 459 East 52nd St. Rugby, Brooklyn, New York 11203 P.S.—Of total of 52 Volumes offered—38 are complete and the balance of 14 vols. are missing only a total of 26 issues.

Success with Marines

Although I have kept freshwater tropicals for a few years, I

have no experience of marines, but I fancied them so I thought I'd have a go. I purchased a 30 in. x 12 in. x 16 in. stainless steel tank. I already had a couple of Premier base filters (size L) and a few spare junction pieces and I made one unit out of the two (see diagram), having six active tubes instead of three and two air lifts instead of one. This is another instance of not throwing old equipment away; a time always comes when you wish that you had not.

I covered the filter with $\frac{1}{8}$ in. white gravel to a depth of about 3 in. at the back sloping down to the front angle. I attached the air lifts to a Miracle twin pump using both pump outputs; this gives a really fierce turnover of water.

I used an outside thermostat and a 125 watt heater, the 12 in. long stem variety being the best if only one heater is used. As I have found in my freshwater tanks, these disperse the heat more rapidly. I filled the tank with synthetic sea water mixed to a specific gravity of 1021—1022. For lighting I installed a 2 ft. Gro-lux tube. I introduced coral and shells, etc., for decorative purposes, first having sterilised them by boiling. I turned on the heating and filtration and left it running for two weeks, before introducing any fish. The tank has now been stocked for four months and I have not changed any water or syphoned the bottom or even used a dip-tube, during this period. I have, on one occasion, scraped the front glass free of brown algae; this is my own fault as, owing to limited space, the only available spot was right next to a window. The water is the clearest I have ever



seen in a marine tank and the fish in spanking condition.

Either I have been very lucky or the difficulty in keeping marines has been grossly exaggerated, and all this frightening and expensive scientific equipment is unnecessary. I genuinely think a lot of aquarists are frightened off this fascinating side of our hobby by these exaggerations. Although I would not recommend marines to the complete beginner, I would say they are well within the scope of the average tropical fish keeper.

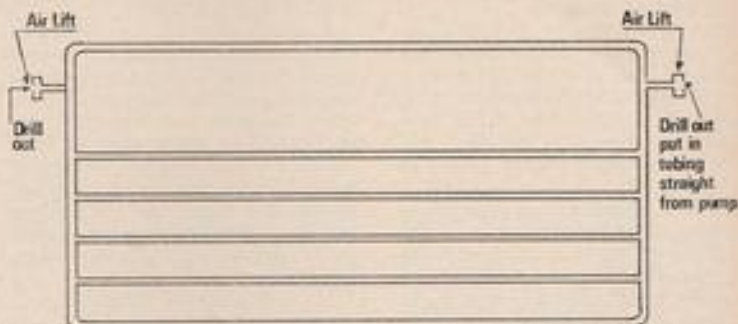
M. E. ROCHE,
26c Sharsted Street,
Walworth, S.E.17.

DIAGRAM

I removed the $\frac{1}{4}$ in. tubing from the air lifts, drilled out the top and put down the ordinary air tubing. This is essential as the existing tube has so small a bore that it becomes choked with salt deposit in about a week.

The *Barbus* question

I have followed the *Barbus* business in the *Aquarist* of recent months with interest and amusement. The situation has been explained very clearly by Messrs. Hems and Klee: it is unwise and unsafe to base generic distinctions (in so tortured and complex a group of fishes as those which at present, for lack of large-scale revision, rest in the catch-all genus *Barbus*) on features such as barbels whose significance is at best equivocal. If I can learn this much from letters and articles in the *Aquarist* why can't Mr. Coles? I'm sure he's really quite a nice chap but doesn't he make himself



sound a smart-alec in print? If he read a bit more, joined a few serious Aquarist Societies and went to some lectures he'd probably make a splendid Ichthyologist. But the arrogance of his letters at present ill becomes one guilty of such elementary errors as abbreviating generic names (*M. pitten*, whatever that is, and *H. pulcher*, see his latest letter) without first stating them in full so that the reader knows what genus he's talking about. And another thing; why doesn't he leave poor young S.R. Winter (age 16, he tells us) alone? It's not "lack of intelligence" he (Winter) displays but a very commendable refusal to get mixed up needlessly in the brain-boiling confusion generated by people who put out ill-considered revisions without either looking at the fishes involved with care or reading the

literature fully. As long as Mr. Winter's attitude doesn't lead to head-in-the-sand-ism it's the best one for all of us as a general working approach.

RUFUS STONE.

F.S.A.S. Handbook

I write to advise you that the 1969/1970 issue of the F.S.A.S. Handbook will be issued to members in the near future.

The Handbook is printed in handy pocket book form, and in addition to containing details of the Federation, its Office Bearers, and the Secretaries and club venues of all affiliated Societies — useful information for aquarists travelling in Scotland — there is a wealth of information in sections covering programme aids, public aquaria and zoos, show management, and articles on the breeding



procedures adopted by the winners of the breeders classes in P.S.A.S. Conventions written by the people who did the breeding.

Last years attempt to hold down the cost of this ambitious publication by using a more economical method of printing did not meet with universal approval, consequently, this new issue has reverted to the more conventional methods which helped to establish our Handbook standard.

Your magazine has generously assisted us with our earlier issues, by drawing the attention of your readers to this publication and its availability to interested aquarists outside our membership. We will again be offering the Handbook outside our membership and copies can be obtained from the Convenor of our Editorial Committee:

J. A. B. JEFFREY, Esq.,
17 Montgomery Street,
Kirkcaldy, Fife.

at a cost, including postage, of 6s. 6d. per copy, cash with order.

We feel that this item of news regarding one of the outstanding amateur aquarist publications will be of interest to your readers.

BRIAN W. FRASER, Honary
Secretary, Federation of
Scottish Aquarist Societies.

Nomenclature of Barbs

I have just read your reprint of Mr. Klee's article on the nomenclature of barbs in the February, 1969, issue, p. 693. I wish to add my endorsement to Klee's article. It is my considered opinion that the generic name *Barbus* should be used for all these fishes until an adequate and extensive systematic review is produced. Unfortunately because the

problem is such a large and complicated one, I do not look forward to seeing this accomplished in my lifetime.

A similar situation occurs in the North American freshwater minnow genus *Notropis*. This is a large genus, but not nearly so large as *Barbus*. Many fine works have been produced on *Notropis* in recent years by very excellent North American ichthyologists. Despite this, the problem of genera and subgenera is far from settled. Aquarists are going to have to be patient and I hope understanding.

STANLEY H. WEITZMAN,

Volumes Missing

On checking our collection of *The Aquarist* which has so far resulted in nine volumes, starting at Volume 18 1953-54, we have found the following issues missing:—

Volume 28, No. 8, December 1963

Volume 28, No. 11, February 1964

Volume 28, No. 13, April 1964

Volume 30, No. 4, July 1965

Volume 31, No. 2, April 1966

Volume 31, No. 6, September 1966

If any of your readers can assist with completing this collection, which is available to any member of the public who lives locally to Werneth Park Study Centre, Frederick St., Oldham, the Centre will be very grateful, and meet all the costs involved. All replies should be addressed to the Curator. Any member may study all the various forms of Natural History, which is dealt with comprehensively.

The Curator,
Werneth Park Study Centre,
Frederick Street,
Oldham, Lancs.

Fellow Aquarists,

As you are no doubt aware the Aquarist and Pondkeeper Exhibition will take place on 10th to 13th July inclusive at the Alexandra Palace, Wood Green, London, N.22.

I have received quite a number of letters regarding the Classes selected for this exhibition, most of them deploring the fact that single fish entries were not being catered for. Surely single fish classes are more than adequately catered for each weekend of the year, besides the organisers had no wish to duplicate or conflict with other Open Shows being staged at or about the same time. This is in my opinion in the best interest of Exhibitors and Show Organisers.

In addition most members of the General Public are unable to comprehend or understand the way in which our fishes are exhibited or judged, they do, however, show great interest in the various types of Furnished Aquaria and it is usually through this medium that they become "bitten by the bug" so to speak and join one of our societies.

The management of *The Aquarist* and *Pondkeeper* have generously decided to finance this venture and to ensure the success of this show, I would appreciate the co-operation of all Clubs and Aquarists, not only by entries but by their assistance with general organisation and stewarding of the show.

If your Club or any member of your Society could assist in any way I would be grateful if they would contact me at the above address before Saturday, 21st June.

SEAN MOONEY, Show Secretary,
The Aquarist and *Pondkeeper*
Fishkeeping Exhibition.



Austrofundulus transilis

by Karl Knaack

photography by author

THIS FISH, a native of South America, belongs to the group of the "Egg-laying toothed Carp". It grows to about 5 cms in length, looks very aggressive, but is quite amicable. The shape of the body is cylindrical and somewhat thickset. The dorsal and anal fins are rounded, and on the male are green, with brown points which become smaller and narrower at the edge so that they appear almost as a line. The edge of these fins is dark brown. The fins are set far back. The anal fin is spread out in the form of a fan, the termination of the tail fin on the male being vertically straight and edged with dark brown. In the middle, on a green background, runs a slightly arched design; the pelvic and pectoral fins are colourless and the latter are fan-shaped. The body shows a slightly violet general tint and some largish brown points reach to the middle of the body. From the middle to the root of the tail some green points stretch which appear as a light wave design. Through the eye runs a vertical black band, the pelvic fins are far back, situated just in front of the anal fin. The mouth is blunt and tilted upwards. The back is slightly arched.

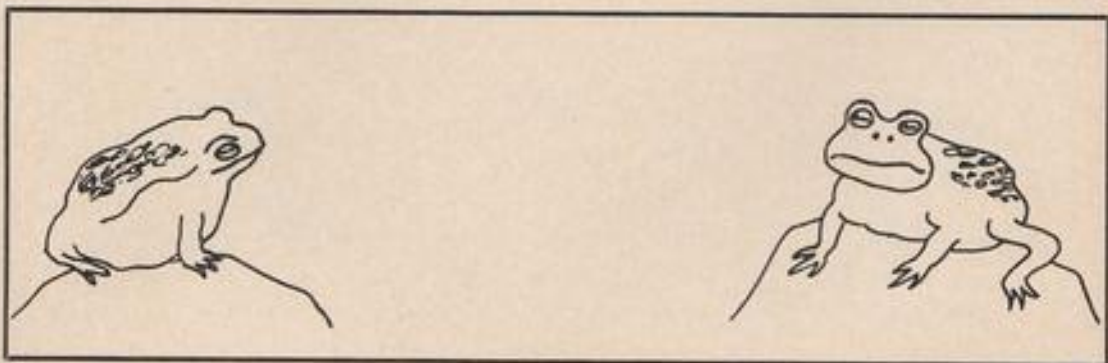
The female is colourless and without any design and all the fins

are colourless. The tail fin, in contrast to that of the male, is rounded, but otherwise all fins have the same shape as those of the male. The shape of the body, back, and mouth as in the male. The band through the eye is lacking.

This fish is a typical bottom spawner. It lives in its home in standing waters, mostly in ponds or in pools which contain water during the rainy season from the end of

May to the end of December. During this period these fish mate almost up to the last day of their life. Then the water dries up completely, the fish die, but first the spawn is sunk into the bottom which is covered with rotten fallen leaves. There it lies for about five

The male strikes an attitude near the female



to six months in the mud, which is damp under the surface. At the first rain and after some hours the first young fish hatch. In the first days plentiful nourishment is provided by the plankton and infusorin which are developed immediately by the dried leaves after rainfall. Later the young fish finds sufficient nourishment from various kinds of insect larvae. So the circle is completed in nature!

In an aquarium the position is somewhat different. We are not tied to any season of the year. The breeder himself can determine the time when he wishes to have young fish especially if sufficient small fodder is available.

Austrofundulus transilis looks really very aggressive but is not so at all. I have never yet seen an injury among rival males or during spawning. Not a scale was ever injured even when several fish were together in a small tank.

The forcing and impressing of this breed is not at all rough. The male displays himself and strikes an attitude in front and near the female until he sees that his partner is willing to spawn, then he swims over the female and touches her back or the back of her neck with his throat. This seems to produce a certain incitement to spawning as the male rides in a slightly crouched attitude over the female until it seeks the spawning substratum. During this action the male controls the direction of swimming of the female by swimming over the female with his pectoral fins. If the female remains stationary for a moment the male places himself on her and imposes his will with outspread fins and frequent



jerking of the head. If the female is willing to spawn, she herself seeks out the intended spawning place. As can be seen from the pictures the male follows. The leading role is always taken by the female. It can happen, however, that both partners at the same time press into the spawning substratum (which in the

Top left: The female is willing to spawn and tries to press into the peat

Bottom: The male immediately follows her

Top right: Spawning then takes place





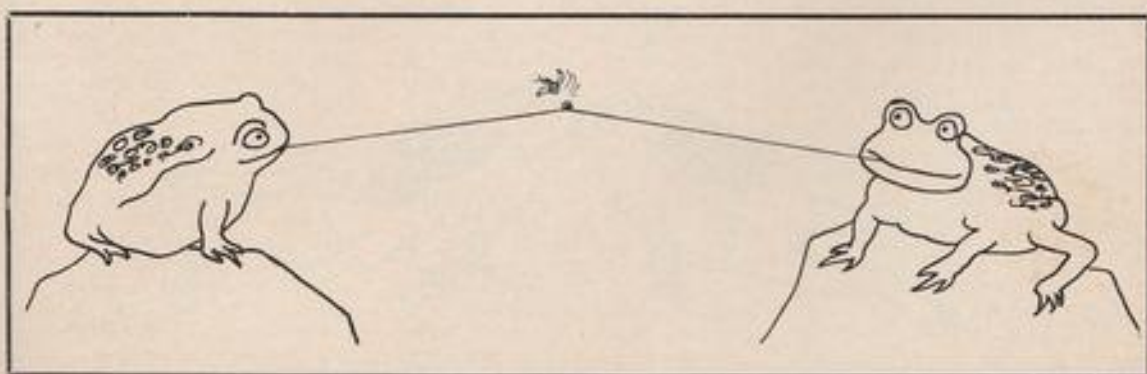
aquarium generally consists of peat) in order to complete their spawning. I seldom find that a typical bottom spawner, as this is, spawns on plants.

This breed of egg-laying toothed carp is known as a so-called seasonal fish. Many fanciers are of the opinion that their life lasts only some months, perhaps six. This is not always the case, because if we keep these fish at a lower temperature of about 18°C their duration of life is considerably

Continued on page 92

Below left: Male and female both press into peat

Below: The male touches the back of neck of female with his throat



A POND IN A FLAT

by G. Drummond

THOUGH LIFE IN a block of flats has several advantages, the lack of a garden in which to build a pond is sometimes irksome. Here is a simple and quick way to get somewhere near the beauty and pleasure of a pond, even if you live fifteen floors up.

My particular indoor pond is made from a galvanized bath. You may find one on a rubbish dump, or an elderly relative might be quite glad to get rid of one. It should first of all be carefully checked for holes—not by just holding up to the light, but by actually putting some water in it. Any leaks can be sealed either with one of the modern metallic glues or with the old-fashioned double washers sold as saucepan menders in small hardware shops. Then the handles should be cut off with a hacksaw. This does make it a problem to shift the bath when it is full of water, but you should not do this anyway. Decide once and for all where you are going to have your pond. If you move it, you will have to at least half empty it. By cutting off the handles the bath can be made to fit better into odd corners—preferably as near a window as possible, for there is no substitute for natural light.

Careful walloping with a hammer of a few pieces of broken paving

stone produces a perfect screen to hide the unsightly metal. These stand vertically around the front and ends of the bath. Another set of slabs sits around the rim, projecting over the water, in such a way that from no angle can any metal be seen. One of these horizontal slabs is a narrow piece along the rear rim. It is supported by a verticle slab in the water at one end.

Other horizontal slabs at each end of the bath sit on the long one at the back and slope towards the front. Horizontal slabs to hide the front rim sit on the end pieces and on the vertical slabs at the front. The great advantage of these horizontal slabs is that as well as providing a natural-looking stone surround, you can keep pots of house plants on them, as seen

in the illustration. Tall plants go at the back, like Bird's Nest fern (top left and top) and *Fatsia japonica* (top right). Trailing plants like *Zebrina* (bottom right) and *Peperomia* (bottom left) and *Plectanthes* (bottom centre) make a thoroughly enjoyable tableau.

In the water I have three plants in balls of soil contained in polythene bags tied loosely around the stems. A few stones at the bottom of the bags keeps them in place.

Very evident in the picture are the lovely golden flowers of the Marsh Marigold, *Caltha palustris*. At the back by the fern pot can be seen the young stems of *Typha latifolia*, the

The setting of a beautiful pond in the middle of your own living room



Great Reedmace. Almost invisible as yet above the triangular slab is a young water lily of the miniature sort, *Nymphaea pygmaea*.

Aeration is provided by an old Otter brought in from a garden pond, but a much smaller model would save expense. All but the central hole of a cascade fountain head should be bunged up, otherwise the pond will be emptied over the carpet. One central hole gives a single column of water which returns completely to the

pond. You can just see the fountain head among the top leaves of the *Plectanthes* plant.

A pond of this size should only accommodate a small number of fish, of course, and these should be of small dimensions. However, the fountain means that you will have no problems of aeration. Neither will you be bothered by masses of fallen leaves in the autumn or ice in the winter.

Clearly, you do not have to use the

same kind of bath as I had handy. My set-up is 34 x 24 x 13 ins. high, but it is up to you to cast around and find a container to suit your requirements of size and shape. The larger the better, of course, from the point of view of beauty, number of plants and kind of fish. Whichever size you choose, I am sure you will be delighted on summer days by the gentle bubbling of the fountain and the rural appearance of your indoor pond.

BOOK REVIEW

JOURNAL OF FISH BIOLOGY

Vol. 1, No. 1 (Academic Press,
26s. 3d.).

This new scientific quarterly from the Fisheries Society of the British Isles, which was formed from the 3rd British coarse fish conference in Liverpool, in 1967, follows a fresh-water bias. Its original papers will interest all aquarists and anglers. An account of furunculosis occurring naturally on the skin of goldfish is identified as the same bacterium *Aeromonas salmonicida* of game fish. It was successfully treated by injecting 5 mg of tetracycline daily for 5 days, according to fish weight. The variable growth of river roach in different years is linked with different summer temperatures. Fish feeding on similar invertebrate foods are shown to vary the proportions between hard-water (chalk) and soft (acid) streams. A further account of the Nature Conservancy's fish-mapping scheme contains some preliminary distribution maps which make one hope for better results before they are finalised. To mention only the North-west, that for the flounder fails to mark up-river haunts in many rivers like Severn, Clwyd, Mersey, Alt and Ribble, and gives only three of many known coastal haunts. That for the ruff misses a water near St Helens in South Lancashire and some locations in Cheshire. However, it corrects Travis Jenkins' book on *The Fishes of the British Isles* in showing that the miller's thumb or bullhead *does*

occur in Scotland, in both Clyde and Forth (where it was apparently introduced), and notes that the char has become extinct in Loch Leven and probably elsewhere. Alien introductions are important too.

An American fluke-worm parasite, *Urocleidus principalis*, has been introduced to British waters with the largemouth black bass. Many editions of the book "Where to Fish" used to list chub in the Welsh Dee when there were none; then, after they removed its name, anglers reintroduced the fish from the Vyrnwy. This will always be the hazard of fish-distribution maps in Britain, when ruff may arrive accidentally in a consignment of fish netted in Yorkshire and get into a water before they are discovered, and aquarists tip exotic species into the warm cooling waters of canals in Lancashire and elsewhere, where they thrive for years.—Eric Hardy.

A ZOO ON YOUR WINDOW-LEDGE

By Joy O. I. Spoczynska (Muller
18s.).

Many books exist on keeping pets, from emotional anthropomorphism by people keeping "playmates" to re-issuing, as if it were new, information already available elsewhere. But this is an uncommonly useful and well-informed little book, particularly suitable for the intelligent scholar or amateur wishing to keep all sorts of small creatures, from fish and reptiles in limited circumstances from window-ledge to laboratory. There is a refreshing background of biological information and practical experience which teachers will wel-

come. It might have been mentioned that sticklebacks are excellent for the study of territory-behaviour, as tank-confinement seems to increase their breeding season aggressiveness. Though their nest-making is the focus of most publicists of this fish, it is more difficult to induce in an aquarium, and then the nest is usually made on the bottom.

Unfortunately, the "locust" held in a boy's photograph on p. 18 is a preying mantis. The Index might have been improved. For example, an illustrated account of planarians is not indexed under that name, or *Turbellaria*. It is misleading to state that "the natterjack" does not occur further north than the 'slacks' and 'mosses' of Lancashire." I have noted this toad breeding at Ravenglass and Solway (Cumberland) and there are records from S.W. Scotland as well as Ireland's Kerry coast south of Castlemaine Bay. In Lancashire it is confined to sand dune "slacks" and coastal marshes. By far the greatest area of "mosses" are low, peaty, inland heaths where it has never occurred.

The author discourages the keeping of water-snails to clear aquaria, as they deprive tanks of oxygen by eating waterweed, as well as eating fishfood, eggs and young fry and carrying fluke-parasites. An old razorblade on a stick is probably better than her soft rag for cleaning tanksides of algae. The book should certainly encourage children to keep more than the traditional tadpoles. But even then, so few people have bred the full life cycle from frogspawn in captivity, inducing the frogs they reared to mate and spawn again in aquaria. A big problem, with school "pets" and aquaria, farming out their care during long holidays, is hardly covered.—Eric Hardy.

Austrofundulus transilis continued

extended. I have kept examples even for two years! Naturally the sexes have to be kept apart for a longer time. If both sexes remain continually together, they spawn up to the last day of their life; they are therefore used up very early, and then live actually for only one season.

For spawning, a tank of 10 litres content is sufficient for a pair; as spawning substratum I give boiled and well-washed peat. I always leave the fish to spawn for 14 days then separate them for eight days. During this time the fish are fed well with nourishing food, e.g., various insect larvae. Then comes the next breeding. The peat is taken out after every time of use and pressed until it is only slightly damp and falls

apart crumbling. Taken up into plastic bags then poured out after five to six months the larvae hatch then generally after a few hours at a temperature of 22° C.

Getting the fish into breeding condition is easy; at the beginning, finely sieved *Cyclops* are given. And after three-four days *Artemia* are taken. After eight days feeding can begin with *Grindal*. Then further rearing presents no more difficulty. At eight weeks the young fish are ready for reproduction.

With the above-mentioned good feeding about 200 to 300 young fish can be aimed at, at one mating.

Austrofundulus transilis is of course not suitable for a common tank. It is best kept in a species tank.



Both fish dig in the peat at the same time in order to spawn. The emergence of an egg from the female can be seen.

Left: The female begins to loosen peat with her head.



from AQUARISTS' SOCIETIES

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

The Huddersfield Tropical Fish Society's Open Show was again a great success. The Best Fish in Show Trophy was won by R. Wilkinson of Halifax and the Trophy for the Best Pair Egg-layers was won by J. Brown of Mixenden. The other winners were as follows: Guppies: 1, 2 and 3, W. J. Orton (Salford); Mollies: 1, J. and H. Derris (Dukeries); 2, E. Slater (Independent); 3, G. Hammet (Huddersfield). Swords: 1, J. F. R. Robinson (Aireborough); 2, N. Gibson (Huddersfield); 3, J. Greysty (Sunnybrow). Platies: 1 and 2, A. Esteves (Top Ten); 3, R. Thompson (Gorton & Openshaw). Small Barbs: 1, Mr. and Mrs. Buxton (Barnsley); 2, J. and H. Derris (Dukeries); 3, Mr. and Mrs. Buxton (Barnsley). Large Barbs: 1, K. Parkes (Merseyside); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, J. A. Whiteley (Aireborough). Small Characins: 1, R. Wilkinson (Halifax); 2, J. Greysty (Sunnybrow); 3, P. Sonley (Independent). Characins, Large: 1, Mrs. Parkes (Merseyside); 2, J. A. Whiteley (Aireborough); 3, J. Tunney (Stockbridge). Carp and Minnows: 1 and 2, Goodwin Bros. (North Staffs.); 3, P. Reynolds (Swillington). Danios and Raoboras: 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, F. Gregory (Ostram); 3, Mr. and Mrs. Hoggarth (Rochdale). Sharks and Flying Foxes: 1, R. Walker (Sheffield); 2, J. Tunney (Stockbridge); 3, F. Mulla (Merseyside). A.O.V. Anabantids: 1, A. Esteves (Top Ten); 2, D. Thompson (Loughborough); 3, A. E. Whitelock (Tadcaster). Fighters: 1, D. W. Smith (Tadcaster); 2, C. Asquith (Castelford); 3, R. Bycroft (Top Ten). Dwarf Cichlids: 1, B. Frost (Dukeries); 2, J. and H. Derris (Dukeries); 3, J. Greysty (Sunnybrow). Large Cichlids: 1, P. Thomson (Aireborough); 2, K. Parkes (Merseyside); 3, M. Naylor (Halifax). Angels: 1, J. Greysty (Sunnybrow); 2, J. and H. Robinson (Aireborough); 3, A. Hudson (Huddersfield). Toothcarps: 1, J. Greenall (Tadcaster); 2, N. Fearn (Stockbridge); 3, R. Walker (Sheffield). Small Catfish: 1, A. Esteves (Top Ten); 2, J. Bamizes (Huddersfield); 3, P. Reynolds (Swillington). Large Catfish: 1, B. Phillips (Ashton-under-Lyne); 2, T. and W. (Sunnybrow); 3, F. Mulla (Merseyside). Loaches: 1, A. Quilton (Valley); 2, M. Ward (Mixenden); 3, R. Walker (Sheffield). Breeders' Livebearers: 1, J. Tunney (Stockbridge); 2, R. Hesley (Barnsley); 3, J. Greenwood (Halifax). Breeders' Egg-layers: 1 and 2, Mr. & Mrs. Buxton (Barnsley); 3, J. and R. Robinson (Aireborough). Pair Livebearers: 1, J. Greysty (Sunnybrow); 2, J. and R. Robinson (Aireborough); 3, H. Gardner (Aireborough). Pair Egg-layers: 1, Mr. and Mrs. J. Brown (Mixenden); 2, J. A. Whiteley (Aireborough); 3, J. Howard (Barnsley). A.O.V. Tropical: 1, F. G. Sibson (Workop); 2, H. C. Naylor (Halifax); 3, P. A. Devine (Ashton). Common Goldfish: 1, E. W. Eaden (Sheffield); 2, Mrs. Davies (Heywood); 3, E. W. Eaden (Sheffield). Fancy Goldfish: 1 and 2, E. W. Eaden (Sheffield); 3, Miss E. Bone (Huddersfield). A.O.V. Coldwater: 1, J. Hooper (Bradford); 2, E. W. Eaden (Sheffield); 3, E. W. Eaden (Sheffield). Juniors: 1, Susan Robinson (Aireborough); 2, Master H. Rhodes (York); 3, Master White (Keighley).

The success of the Association of Manchester and District Aquarist Societies first open show was assured by over three

hundred entries from twenty-two societies competing. Best Fish in Show Award went to Mrs. V. Parkes of Merseyside. The Societies' Trophy for most points in the show was also won by Merseyside. The results of the show were as follows: Guppies: 1, B. Worrall (Warrington); 2 and 3, G. Hammet (Huddersfield); Mollies: 1, G. Hammet (Huddersfield); 2, G. Kershaw (Heywood); 3, Mrs. Grimshaw (Sunnybrow). Swordtails: 1, Mr. Kelly (Merseyside); 2, G. Hammet (Huddersfield); 3, P. Ledger (Top Ten). Platies: 1, R. Thompson (Gorton & Openshaw); 2, Mr. Phillips (Ashton-under-Lyne); 3, B. Thompson (Gorton & Openshaw). A.O.V. Livebearers: 1, L. Kaye (Top Ten); 2, T. & W. (Sunnybrow); 3, Mr. Wakefield (Ostram). Small Anabantids: 1, F. Mulla (Merseyside); 2, A. G. Esteves (Top Ten); 3, W. Smith (Merseyside). A.O.V. Anabantids: 1, Mr. & Mrs. Bone (Huddersfield); 2, Miss H. Newall (Glossop); 3, W. Chapman (Valley). Fishbarns: 1, A. E. Addison (Warrington); 2, S. Semizraiz (T.A.B.); 3, T. Sendzinski (T.A.B.). Small Barbs: 1, D. J. Hopwood (Rochdale); 2, Mr. Middleton (Sunnybrow); 3, Mr. & Mrs. Webb (Salford). Large Barbs: 1, Mrs. Grimshaw (Sunnybrow); 2, Mr. Kershaw (Heywood); 3, Mr. Watson (Sunnybrow). Small Cichlids: 1, W. Smith (Merseyside); 2, L. Kaye (Top Ten); 3, A. G. Esteves (Top Ten). Large Cichlids: 1, K. Parkes (Merseyside); 2, J. Watson (Sunnybrow); 3, B. McDermott (Merseyside). Anguils: 1, D. Trace (Ashton-under-Lyne); 2, R. Hughes (Gorton & Openshaw); 3, G. Hammet (Huddersfield). Small Characins: 1, R. Lord (Rochdale); 2, J. T. Morris (Bolton); 3, A. G. Esteves (Top Ten). Med. Characins: 1, N. Parkes (Merseyside); 2, S. Harrop (Ostram); 3, B. Parkin (Huddersfield). Large Characins: 1, V. Parkes (Merseyside); 2, J. Murray (Salford); 3, D. Thomalla (Merseyside). Raoboras: 1 and 2, P. & H. Gorton & Openshaw; 3, Mr. & Mrs. Webb (Salford). Danios: 1, P. Tempest (Oidham); 2, Mr. & Mrs. Hoggarth (Rochdale); 3, A. Middleton (Sunnybrow). Sharks: 1, W. Isaac (Rochdale); 2, S. Harrop (Ostram); 3, Mrs. Grimshaw (Sunnybrow). Foxes: 1, R. Moorcroft (Merseyside); 2, F. Mulla (Merseyside); 3, R. Hughes (Gorton & Openshaw). Toothcarps: 1, W. Chapman (Valley); 2, C. Shaw (Merseyside); 3, J. Roberts (Nelson). Small Catfish: 1, Mr. Kershaw (Heywood); 2, T. and W. (Sunnybrow); 3, A. Newall (Glossop). A.O.V. Catfish: 1, B. Phillips (Ashton-under-Lyne); 2, F. Mulla (Merseyside); 3, A. G. Esteves (Top Ten). Loaches: 1, A. Quilton (Valley); 2, F. Mulla (Merseyside); 3, M. D. Smith (Glossop). Breeders' Egg-layers: 1, Master A. Kaye (Huddersfield); 2, Mr. & Mrs. Smith (Glossop); 3, J. W. Higham (Warrington). Breeders' Livebearers: 1, R. Moorcroft (Merseyside); 2, R. Tomkinson (Glossop); 3, Miss B. Kaye (Huddersfield). Pair Livebearers: 1, G. Hammet (Huddersfield); 2, Mr. & Mrs. Hoggarth (Rochdale); 3, B. Worrall (Warrington). Pair Egg-layers: 1, D. Thomalla (Merseyside); 2, B. Parkin (Huddersfield); 3, P. Ledger (Top Ten). Fancy Goldfish: 1, Miss Bone (Huddersfield); 2, S. Walsh (Accrington); 3, A. Itherwood (Accrington). A.O.V. Coldwater: 1 and 2, C. Whitney (Accrington); 3, Not awarded. A.O.V.: 1, R. Moorcroft (Merseyside); 2, P. and A. Devine (Ashton-under-Lyne); 3, D. Thomalla (Merseyside). Juniors: 1, Master D. Moorcroft (Merseyside); 2, Master

B. Seabright (Gorton & Openshaw); 3, Master A. Kaye (Huddersfield).

Swillington A.S. held their fourth Inter-Society Table Show recently, with R. M. Faircliff and J. Skinner judging the exhibits while the guests attended the auction of fish, plants, and equipment. Results were as follows: Guppies: 1, Mr. Thickbroom (Castelford); 2, Mr. Taylor (Aireborough); 3, Mr. Heptinstall (Castelford). Livebearers: 1, Mr. Burnap (Aireborough); 2, Mr. Garforth (Mixenden); 3, Mr. Poston (Selby). Barbs: 1 and 2, Mr. and Mrs. Buxton (Barnsley); 3, Mr. Whiteley (Aireborough). Characins: 1, Mr. and Mrs. Howard (Barnsley); 2, Mr. Monk (Aireborough); 3, Mr. Kay (Aireborough). Cichlids: 1, Mr. Taylor (Aireborough); 2, Mr. Carey (York); 3, Mr. Thompson (Aireborough). Catfish and Loach: 1, Miss Helm (Horsforth); 2, Mr. Audsley (Horsforth); 3, Mr. Gates (Castelford). Carps and Minnows: 1, Mr. Gates (Castelford); 2, Mr. Scarff (Selby); 3, Mr. Coors (Horsforth). Fighters: 1 and 3, Mr. Smith (Tadcaster); 2, Mr. Iveson (Aireborough). Anabantids: 1, Mr. Hesley (Barnsley); 2, Mr. Brown (Mixenden); 3, Mr. Ward (Mixenden). Toothcarps: 1, Mr. Greenall (Tadcaster); 2, Mr. Smith (Tadcaster); 3, Mr. Megson (Aireborough). Livebearers pairs: 1, Mr. Thickbroom (Castelford); 2, Mr. Wimbles (Swillington); 3, Mr. Helstrip (Aireborough). Egg-layer pairs: 1, Miss Helm (Horsforth); 2, Mr. Brown (Mixenden); 3, Mr. Taylor (Aireborough). Breeders Livebearers: 1 and 3, Mr. and Mrs. Buxton (Barnsley); 2, Mr. Smith (Tadcaster). Breeders Egg-layer: 1, Mr. and Mrs. Robinson (Aireborough); 2, Mr. Binks (Swillington); 3, Mr. Hesley (Barnsley). A.O.V.: 1, Mr. Carey (York); 2, Miss Helm (Horsforth); 3, Mr. Turner (York). Furnished jars: 1, Mr. and Mrs. Flint (Swillington); 2, Mr. Thompson (York); 3, Mr. Audsley (Horsforth).

Mr. Carey of York won the Best Fish in Show Award, with a Siamese Tiger fish, and Aireborough and District A.S. won the Swillington challenge shield for the society gaining most points. On show was the Duralee Trophy, a magnificent two-foot-high cup, which has been presented by the Duralee Battery Company to be awarded annually to the society gaining most points at Swillington's Open Table Show.

ABOUT thirty members and their guests attended the April meeting of the **Horsforth A.S.** The Chairman, Mr. Coombes, reported on the recent annual general meeting of the Association of Southern Aquatic Societies, of which he had just been elected Chairman. In an East-West Competition, the East side were the victors.

The main item of the evening then followed, a Photo Quiz, by L. James and R. Matley. The Table Show, which was judged in the interval by L. James, produced the following results. Guppy: 1, Mr. Davis; 2 and 3, Mr. Painter. Fancy Goldfish: 1 and 2, B. Coombes. Next followed a raffle and auction, and the presentation of the Annual Points Trophy to Mr. Watkins, who had gained a total of 16 points. During the second half of the meeting, R. Matley showed some of his excellent colour slides, accompanying his show with some useful tips about the fish.

THREE members of the **Guldford and District A.C.** gave short lectures recently on the lighting, heating and filtration problems most aquarists meet with. Much technical information and advice was given by these

**IN AQUARIUM OR POND
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knowledgeable amateurs. An exciting and well supported inter-club show was held between the Woking, Farnborough and Guildford Clubs. The results were very close, but Woking came out on top with most points, Farnborough being second, and Guildford were last. During the judging there was a lively and amusing discussion on the advantages and disadvantages of using tap water in community tanks. No conclusions were drawn but opinions were freely given. Meetings are held on the second and fourth Wednesdays of each month. The secretary, Mr. J. D. Cole, 16 Weydon Hill Close, Farnham, Surrey, will be pleased to supply further details.

THE Bury and District A.S. Open Show results were as follows: Guppies: 1, 2 and 3, W. J. Orton (Salford); Platys: 1, L. Wood (Bury); 2, Mr. and Mrs. A. Hoggarth (Rochdale); 3, R. Wilkinson (Halifax). Molies: 1, Mr. and Mrs. J. Heap (Belle Vue); 2, Mr. and Mrs. A. Hoggarth (Rochdale); 3, M. Holt (Bury). Swordtails: 1, R. Wilkinson (Halifax); 2, M. Jones (Valley); 3, Mr. and Mrs. A. Hoggarth (Rochdale). Small Characins: 1 and 2, R. Wilkinson (Halifax); 3, M. Jones (Valley). Large Characins: 1, N. Turner (Muxenden); 2, J. Murray (Salford); 3, A. Mills (Bury). Small Barbs: 1, N. Valentine (Independent); 2, M. Jones (Valley); 3, Mr. and Mrs. P. Webb (Salford). Large Barbs: 1, D. & R. Standen (Loyne); 2, J. Murray (Salford); 3, M. Jones (Valley). Dwarf Cichlids: 1, Mr. and Mrs. M. Brown (Muxenden); 2, Miss B. Kaye (Huddersfield); 3, J. Jennings (Bury). A.O.V. Cichlids: 1 and 2, D. and R. Standen (Loyne); 3, S. Hurst (Muxenden). Fishers: 1, A. Beasley (Ostram); 2, Mr. and Mrs. P. Webb (Salford); 3, J. Roberts (Nelson). A.O.V. Labrynth: 1, Mr. and Mrs. M. Brown (Muxenden); 2, Mr. and Mrs. P. Taylor (Bury); 3, W. Chapman (Valley). Rasboras Danos and Minnows: 1 and 3, Mr. and Mrs. P. Webb (Salford); 2, Mr. and Mrs. A. Hoggarth (Rochdale). Egg Laying Tooth Carps: 1 and 2, W. Chapman (Valley); 3, I. Wood (Bury). Catfish: 1 and 3, T. and W. (Sunny Brow); 2, D. and R. Standen (Loyne). Loach: 1, A. Quirton (Valley); 2, Mr. and Mrs. A. Hoggarth (Rochdale); 3, Mr. and Mrs. P. Webb (Salford). Sharks and Flying Foxes: 1, S. Harrop (Ostram); 2, Mr. and Mrs. H. Cooper (Bury); 3, D. and R. Standen (Loyne). Pairs (Livebearers): 1, R. Wilkinson (Halifax); 2, M. Jones (Valley); 3, Mr. and Mrs. A. Hoggarth (Rochdale). Pairs (Egg Layers): Mr. and Mrs. M. Brown (Muxenden); 2, J. Murray (Salford); 3, J. Roberts (Salford). Breeders (Egg Layers): 1, D. Whitehead (Blackpool); 2, Master A. Kaye (Huddersfield); 3, K. Dixon (Halifax). Breeder (Livebearers): 1, W. J. Orton (Salford); 2, Mr. and Mrs. A. Hoggarth (Rochdale); 3, R. Wilkinson (Halifax). A.V. Aquatic Plant (Rooted): 1, A. Beasley (Ostram); 2 and 3, T. Hardman (Bury). A.V. Aquatic Plant (Cutting): 1, T. Hardman (Bury); 2, Mr. and Mrs. P. Taylor (Bury). A.V. Tropical: 1, D. and R. Standen (Loyne); 2, Mr. and Mrs. M. Brown (Muxenden); 3, Mr. and Mrs. P. Webb (Salford). A.O.V. Goldwater: 1, Mrs. K. Buckley (Bury); 2 and 3, C. Whitney (Accrington). Angels: 1, A. Moyle (Leyton); 2, D. and R. Standen (Loyne); 3, Mr. and Mrs. H. Cooper (Bury).

The Best Fish in the Show was the Siamese Fighter owned by A. Beasley (Ostram) and there were 256 entries.

The results of the Coventry Pool and Aquarium Society Table Show for April were—Barbs: 1, S. Woodrider; 2, E. Sheehy;

J. E. Leggett. Characins: 1, T. Luckman; 2, L. Green; 3, E. Sheehy. Breeders Egglayers: 1, 2 and 3, E. Leggett.

A STEADY increase in membership is reported from the Merseyside A.S. and there are already 114 members in the Society. Recently, the Society enjoyed a talk from Vice-Chairman Bill Kelly on the construction of an all glass tank with a demonstration of his method. Concurrently with the talk the first Mini-Jar competition was held which was won by Roy Clarke a new junior member. A table show attracted no less than 114 entries and for the first time Norman Petersen was the recipient of the Best Fish in the Show award.

OPEN Show Results of the Y.D.A.S. were as follows: Guppy: 1, G. Thickbroom (Castleford); 2, Mr. Watson (Hartlepool); 3, P. Reynolds (Swillington). Molies: 1, T. Collinson (Hull); 2, J. and H. Dornie (Dukeries); 3, Mr. and Mrs. Burnap (Aireboro). Swords: 1, Mr. and Mrs. Burnap (Aireboro); 2, T. Douglas (Hull); 3, T. Walling (Selby). Platies: 1, J. and H. Dornie (Dukeries); 2, R. Walker (Sheffield); 3, T. Douglas (Hull). A.O.V. (Livebearers): 1, P. Haigh (Swillington); 2 and 3, D. Dickson (Swillington). Barbs (up to 3 in.): 1 and 3, F. Buxton (Barnsley); 2, J. A. Whately (Aireboro). Barbs (over 3 in.): 1, M. Allison (York); 2, M. H. Cooper (York); 3, J. A. Whately (Aireboro). Characins: 1, F. Buxton (Barnsley); 2, Mr. and Mrs. Burnap (Aireboro); 3, P. M. Robinson (Huddersfield). Characins: 1, J. A. Whately (Aireboro); 2, G. Monk (Aireboro); 3, P. Souley (Independent). Carps, Minnows: 1 and 2, P. Reynolds (Swillington); 3, A. Jackson (Dukeries). Rasbora Danio: 1, Mr. Rimmer (Hull); 2, R. Walker (Sheffield); 3, T. Douglas (Hull). Sharks, Flying Fox: 1, Mr. Scall (Selby); 2, R. Walker (Sheffield); 3, J. and H. Dornie (Dukeries). Siamese Fishers: 1, R. Walker (Sheffield); 2, R. Cooper (York); 3, D. W. Smith (Tadcaster). A.O.V. Anabantids: 1, E. Whitecock (Tadcaster); 2, D. Hockley (York); 3, A. Rowbottom (Hartlepool). Cichlids (Dwarf): 1, J. H. Dornie (Dukeries); 2 and 3, R. Taylor (Aireboro). Cichlids (A.O.V.): 1, Mr. and Mrs. Hargreaves (York); 2, P. Carry (York); 3, A. Rowbottom (Hartlepool). Corydoras: 1, Mr. Soncliffe (York); 2, T. W. Gasheene (Swillington); 3, J. Kay (York). Catfish (A.O.V.): 1, P. Carry (York); 2, A. Rowbottom (Hartlepool); 3, Mr. and Mrs. Stringer (Swillington). Loach: 1, M. Allison (York); 2, R. Walker (Sheffield); 3, D. Dickson (Swillington). E.L.T.: 1, Mr. Curle (Independent); 2, L. Greenall (Tadcaster); 3, J. Holmes (Tadcaster). Breeders (Livebearers): 1, G. Monk (Aireboro); 2, A. Harrison (Hull); 3, V. & N. Fean (Socksbridge). Breeders (Egglayers): 1, F. Buxton (Barnsley); 2, P. Souley (Independent); 3, D. W. Smith (Tadcaster). Matched Pairs (Livebearers): 1, G. Thickbroom (Castleford); 2 and 3, P. Reynolds (Swillington). Pairs (Egglayers): 1, R. Taylor (Aireboro); 2, J. A. Whately (Aireboro); 3, D. Jackson (Dukeries). A.O.V. (Tropical): 1, P. Carry (York); 2, B. Frost (Dukeries); 3, A. Rowbottom (Hartlepool). Goldwater (A.V.): 1 and 2, Mr. Eadon (Sheffield); 3, J. Hooper (Beafield). Furnished Show Jars: 1, Mrs. Hardman (Cleveland); 2, A. Turner (York); 3, J. Hilda (York). Best Fish in Show: 1, J. and H. Dornie (Dukeries)—Orange Chromide. Exhibitor gaining most points: R. Walker (Sheffield).

AT the first of the April meetings of Walthamstow and District A.S., Mr. B. Senior of Enfield A.S. gave members a great deal of information on the Cichlids of Lake Malawi and their requirements for successful breeding and rearing. The table show for scored pairs was judged by D. Wain, also of Enfield A.S., and first place in the egglayers section was awarded to R. Taylor and first place for livebearers was taken by B. Mather.

At the second of the April meetings F.B.A.S. lecturer B. Pye projected colour transparencies of many tropical aquarium plants and gave information as to their growth and requirements

for successful propagation. Particulars of future meetings of the Society may be obtained from the Secretary, A. R. Chandler, 68 Uplands Road, Woodford Bridge, Essex.

THERE was a good attendance at the April meeting of the New Forest A.S. The programme consisted of two main items, a quiz and a talk on popular aquarium fishes presented by Messrs. R. Masley and L. James of the Bournemouth Club. Both items were illustrated by some excellent colour slides. During the interval there was a raffle and an auction of plants and fishes. The table show results were: Characins: 1, D. Hare; 2, K. Aust; 3, D. Letts; 4, J. Lane. Cichlids: 1, R. Trevett; 2, K. Newton; 3, A. Williamson; 4, K. Newton. Specials were awarded to: M. Lee and D. Harding.

MEMBERS of the Bristol Tropical Fish Club were provided with an enlightening talk on the Composition of Water and its Effects at the March meeting. This was presented by Mr. H. C. B. Thomas an established club member who was able to punctuate the talk with his typical humorous examples. The Table Show was for Catfish and Loaches and the following results were obtained:

Open: 1, J. Smith (C. Aeneus); 2, F. Brown (B. Strigata); 3, P. Brown (C. Melanostus). Novice: 1, J. Smith (C. Aeneus); 2, J. Smith (Kahili); 3, C. Webb (S. Nigricentris).

The April meeting was extremely well attended, the feature being an American slide film of the Livebearers. This was most interesting and well received and it is heartening to learn that further films from the same source will be presented shortly. During the interval judging of the Table Show for Guppies and Platies took place and the following results were given:

Platies (Open): 1 and 2, B. Clark; 3, P. Brown. (Novice): 1, J. Smith; 2, M. Ford. Guppies (Male): (Open): 1 and 3, P. Brown; 2, C. Webb. (Novice): 1, C. Webb; 2, Mr. Crutch; 3, J. Smith. Guppies (Female): (Open): C. Whitmarsh; 2, R. Day; 3, J. Smith. (Novice): 1, C. Whitmarsh; 2, R. Day; 3, J. Smith. Arrangements for the club's Annual Open Show on 28th—29th June are now firmly established and it is hoped an even greater number of societies will be competing whilst visitors are assured of a worthwhile day.

MENTION is made in the Leamington and District A.S. newsletter of a grand challenge match to be arranged between the Midland Aquarist League and the South Thames Aquarist Group, on a home and away basis. Details should be available shortly. There is also the usual varied selection of news items and aquatic articles.

RECENT activities at the Usbridge and District A.S. meetings have been a talk by Dave Lelliot and John Cooper on every aspect of characin keeping and breeding. This was one of the best illustrated slide lectures the Society has had for ages and is recommended to other clubs. The two lecturers can be contacted through the Verulam Aquatic Group. There has also been a fish judging competition under the guidance of B. Baker. Also at this meeting there was a table show, judged by T. Summers, which attracted the largest entry so far this year.

AT the April meeting of the Castleford and District A.S. the society held an Auction and many bargains were bid for by over twenty members. The monthly Table Show was judged by Mr. Cohen and Mr. Tranter the results being: Goldfish: 1, G. Thickbroom; 2 and 3, A. Town. Angelfish: 1, G. Thickbroom; 2, T. Fenner; 3, I. Hippenstall. Cichlids: 1, F. and M. Gans; 2, S. Horsley; 3, G. Thickbroom.

THE results of the Winchester and District A.S. Second Open Show were as follows:

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Best fish in show—Texas Cichlid: 1, J. Perman (Gosport); Cichlids: 1, J. Perman (Gosport); 2, D. V. Jones (Winchester); 3, R. Blight (Basingstoke); 4, T. Hazton (Weymouth). Angels: 1, A. G. Cox (Weymouth); 2, A. Jackson (Mid-Sussex); 3, M. Sainsbury (Salisbury); 4, D. Harding (New Forest). Platies: 1, Miss C. Littlewood (Gosport); 2, J. Mercer (Winchester); 3, D. Harding (New Forest); 4, M. Sainsbury (Salisbury). Mollies: 1, M. Mansbridge (Southampton); 2, J. Mercer (Winchester); 3, D. V. Jones (Winchester). Swordtails: 1 and 2, P. H. Halliwell; 3, K. A. Winstade (Basingstoke); 4, J. D. Turner (Weymouth). Labyrinths: 1, D. V. Jones (Winchester); 2, J. Rawlings (Winchester); 3 and 4, R. N. Wynd (Parnborough). Guppies (male): 1 and 4, C. Beets (Portsmouth); 2, D. V. Jones (Winchester); 3, M. Davies (Reading); Guppies (female): 1, C. Beets (Portsmouth); 2 and 3, T. Walker (Guildford); 4, D. V. Jones (Winchester). Characins: 1, A. G. Cox (Weymouth); 2, K. A. Winstade (Basingstoke); 3, C. Beets (Portsmouth); 4, M. J. Illick (Gosport). Barbs: 1, A. G. Cox (Weymouth); 2 and 3, E. Cox (Brighton); 4, T. Walker (Guildford). Danios-Rasbora-Minnows: 1, P. Tee (Brighton); 2, D. V. Jones (Winchester); 3, C. F. Smith (Portsmouth); 4, P. Titheridge (Winchester). Higglying Toothcarps: 1, R. N. Wynd (Parnborough); 2, D. V. Jones (Winchester); 3, T. Walker (Guildford); 4, M. Davies (Reading). Corydoras: 1, G. T. Horton (Weymouth); 2, E. Cox (Brighton); 3, C. F. Smith (Portsmouth); 4, T. Hicks (Weymouth). A.O.V. Catfish: 1, D. Rogers (Weymouth); 2, A. Jackson (Mid-Sussex); 3, J. Rawlings (Winchester); 4, T. Walker (Guildford). Loaches: 1 and 3, P. Tee (Brighton); 2 and 4, M. J. Illick (Gosport). A.O.V. Tropical: 1, M. J. Illick (Gosport); 2, M. Sainsbury (Salisbury); 3, C. Beets (Portsmouth); 4, J. D. Turner (Weymouth). Common Goldfish: 1, and 4, V. Voysey (Salisbury); 2, C. Beets (Portsmouth); 3, D. F. Harding (New Forest). A. V. Shubankin: 1, V. Voysey (Salisbury). Doubletails: 1 and 2, D. Stokes (Portsmouth); 3, V. Hant (Portsmouth). A.O.V. Coldwater: 1, V. Voysey (Salisbury); 2, D. F. Harding (New Forest); 3, V. Hant (Portsmouth); 4, C. F. Smith (Portsmouth). Tropical Egg-layers: (Breeders): 1, T. Walker (Guildford); 2 and 4, D. V. Jones (Winchester); 3, A. R. Thompson (Litchampten). Tropical Livebearers (Breeders): 1, P. Tee (Brighton); 2, J. D. Turner (Weymouth); 3, P. James (Winchester); 4, C. Beets (Portsmouth). Tropical Pairs: 1, T. Walker (Guildford); 2, T. Hazton (Weymouth); 3, P. Tee (Brighton); 4, D. V. Jones (Winchester). Furnished Tropical Aquaria: 1, Winchester A.S.; 2, Portsmouth A.S. Furnished Tropical Individual: 1, J. Rowe (Southampton).

The clubs meeting place is The Cricketers Inn, Bridge Street, Winchester. Meetings are held every other Friday at 8 p.m. Visitors and prospective new members are cordially invited to attend.

THE CHESTER AND DISTRICT A.S. held their Annual General Meeting and Dinner recently, when the following officers were elected: Chairman: P. Millington; Secretary: Mrs. A. Dutton; Treasurer: G. M. Jones; Committee members: C. Bowyer and F. Tilton. The awards were presented by F. Williams, the curator of Chester Zoo Aquarium as follows: Mothershead Cup: P. Millington; Runner-up Shield: G. Maddams; Russell Allen Trophy: C. Bowyer; John Evans Trophy: R. Dutton; Pabo Trophy: P. Millington; Fish of the Year Shield: R. Dutton.

Previous meetings included a talk on Killifish by Bernard Jones from Llangollen and a slide tape lecture kindly loaned by Bill Devision of Tipton, Staffs. The Society held the first Annual Fish of the Year Show where a large variety of fishes were exhibited; the winning fish was a *Toxotes jaculator*, second *Corydoras aeneus* and third *Barbus nigrofasciatus*. Previously the members had visited Wrexham Tropical Fish Society and were entertained by a slide lecture on the B.A.F.

TWENTY-ONE societies were represented at the Nelson A.S. Open Show. The results were as follows: Guppies: 1, 2 and 3, W. J. Orton (Salford). Swordtails: 1, N. R. Gibson (Huddersfield); 2, J. Gesty (Sunnybrow); 3, Mr. and Mrs. Burnap (Keighley); Mollies: 1, Master D. Lacy (Aireborough); 2, David R. Starden (Loyne); 3, Mr. and Mrs. Burnap (Keighley). Platies: 1 and 2, A. G. Esteves (Top Ten); 3, A. Lyons (Nelson). Small Characins: 1, M. Jones (Valley); 2, J. Gesty (Sunnybrow); 3, J. D. Meredith (Mixerden). Large Characins: 1, F. Ledger (Top Ten); 2, B. Pickles (Keighley); 3, C. Showdon (Nelson). Small Barbs: 1, D. Carlos (Nelson); 2 and 3, J. Tomlinson (Clitheroe). Large Barbs: 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, Mr. and Mrs. Burnap (Keighley); 3, M. Jones (Valley). Fighters: 1, K. Beresford (Rochdale); 2, P. Ledger (Top Ten); 3, M. Davies (Heywood). Other Anabantids: 1, A. G. Esteves (Top Ten); 2, A. Middleton (Sunnybrow); 3, A. B. White (Keighley). Catfish: 1, B. Phillips (Ashton under Lyne); 2, L. Kaye (Top Ten); 3, Master D. Lacy (Aireborough). Loaches: 1 and 2, T. and W. (Sunnybrow); 3, Mr. Quinton (Valley). Sharks and Flying Foxes: 1, A. B. White (Keighley); 2, C. Snowdon (Nelson); 3, I. Watson (Sunnybrow). Angels: 1 and 2, A. Moyle (Leigh); 3, B. Tate (Nelson). Dwarf Cichlids: 1, J. D. Meredith (Mixerden); 2, L. Kaye (Top Ten); 3, D. Kennedy (Bradford). Large Cichlids: 1, D. Kennedy (Bradford); 2 and 3, D. and R. Standen (Loyne). Rasbora: 1, J. Saline (Loyne); 2, Mr. and Mrs. Webb (Salford); 3, Mr. and Mrs. Grimshaw (Sunnybrow). Toothcarps: 1, 2 and 3, J. Roberts (Nelson). Danios: 1, A. G. Esteves (Top Ten); 2, Mr. and Mrs. Webb (Salford); 3, A. B. White (Keighley). A.O.V. (Tropical): 1, D. and R. Standen (Loyne); 2, B. Pickles (Keighley); 3, J. Helm (Horsforth). Pairs (Livebearers): 1, Mr. and Mrs. Hoggarth (Rochdale); 2, J. Gesty (Sunnybrow); 3, W. J. Orton (Salford). Pairs (Egglayers): 1, B. Parkin (Huddersfield); 2, D. and R. Standen (Loyne); 3, C. Snowdon (Nelson). Breeders (Livebearers): 1, M. Jones (Valley); 2, A. Baldwin (Nelson); 3, Mr. and Mrs. Hoggarth (Rochdale). Breeders (Egglayers): 1, A. Cass (Macclesfield); 2, Mr. and Mrs. Webb (Salford); 3, B. Dearby (Keighley). Fantail Goldfish: 1, W.P.K.C. (Oldham); 2, C. Wallbank (Accrington); 3, Mr. Whitney (Accrington). A.O.V. Coldwater: 1 and 2, Mr. Whitney (Accrington); 3, C. Wallbank (Accrington). Junior Tropical: 1, R. Bone (Nelson); 2, Master White (Keighley); 3, Master A. Kaye (Huddersfield). Junior Coldwater: 1, 2 and 3, Master A. Kaye (Huddersfield). The Best Fish in the Show award went to D. Kennedy (Bradford) with a Severum Cichlid.

MEMBERS OF THE BRIGHTON AND SOUTHERN A.S. were recently entertained by Mr. Derek Riley of Wrothing, who gave a very interesting lecture on breeding techniques.

Arrangements have been completed and work is going on for the Sixth Annual Open Show, to be held on Sunday, 15th June at the Marmon Centre, Marmon Road, Hove. All previous records were broken by last year's show, in which there were 470 entries, including the Guppies benched on the P.G.A. stand by the South London Section. This exceeded the figure for any of the previous shows and it is sincerely hoped that this year's figure will be even higher.

Entries must be benched by 12 noon sharp. Lucky number programmes will be on sale to members of the public, who are invited to visit the show between the hours of 3 and 6 p.m. Show schedules can be obtained from Mr. R. Browning, 34 Rowan Close, Portslade, Sussex.

At the last meeting, **Enfield and District A.S.** had a very successful quiz. The table show was for swordtails and platies and the winners were: Swordtails: 1 and 3 and 4, J. Whitaker; 2, Mrs. D. Howe. Platies: 1 and 3, B. Bird; 2, D. Watts; 4, S. Dyle.

Six new members were enrolled and more new members will be welcomed. The meetings are held every third Thursday at St. Andrew's Church Hall at 8 p.m.

THE Guildford and District A.C. were recently entertained by Mr. Norris of Bracknell Aquarist Club with a slide show of various prize-winning fishes, mainly belonging to Bracknell Club members, also some slides showing his own feelings and opinions about fishkeeping in general. Altogether it was a most interesting and amusing evening.

There has been also a tape and slide show on the egg development of Killifish. This was most interesting as it showed, with the aid of microphones, the various stages of development of the fry within the egg. It also showed in close detail the differences in the eggs of the three main types of Killifish. There was also a display of many kinds of Killifish, belonging to club members. New members are welcome and the Secretary's address is: J. D. Cole, 16 Weyden Hill Close, Farnham, Surrey.

THE Belle Vue Open Show was supported by fourteen societies who benched 238 entries. Best fish in show award, a three foot tank donated by A. Henshaw, was won by B. Phillips, Ashton-under-Lyne A.S. The results were as follows: Livebearers: Guppies: 1, E. Wells (Sunnybrow); 2, R. Ward (Mixerden); 3, I. Roberts (Bell Vue). Swordtails: 1, J. Gesty (Sunnybrow); 2, M. and B. (Huddersfield); 3, A. Wild (Salford). Platies: 1 and 2, R. Thompson (Gorton and Openshaw); 3, J. Gesty (Sunnybrow). Mollies: 1, Mr. and Mrs. Heap (Heywood); 2, J. Gesty (Sunnybrow); 3, Mr. and Mrs. Brown (Mixerden). Large Barbs: 1, K. Parkes (Merseyside); 2 and 3, Mr. and Mrs. Grimshaw (Sunnybrow). Small Barbs: 1, S. Gerrard (Alfreton); 2, J. Murray (Salford); 3, Mr. and Mrs. Wright (Alfreton). Large Characins: 1, V. Parkes (Merseyside); 2, J. Murray (Salford); 3, F. Ledger (Top Ten). Small Characins: 1, Mr. and Mrs. Wright (Alfreton); 2, D. Wragg (Alfreton); 3, S. Gerrard (Alfreton). Rasbora: 1, S. Gerrard (Alfreton); 2, G. Hodgkinson (Gorton and Openshaw); 3, D. Thomalla (Merseyside). Sharks and Foxes: 1, R. Moorcroft (Merseyside); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, F. Mulla (Merseyside). Killifish: 1 and 2, D. Wragg (Alfreton); 3, N. Swanson (Merseyside). Minnows and Carps: 1, S. Gerrard (Alfreton). Cichlids (Angels): 1 and 2, A. Moyle (Leigh); 3, M. Allsop (Alfreton). Cichlids (Dwarf): 1, Mr. and Mrs. Brown (Mixerden); 2, I. Roberts (Belle Vue); 3, L. Kaye (Top Ten). Cichlids (Large): 1, K. Parkes (Merseyside); 2, F. Mulla (Merseyside); 3, Mr. and Mrs. Wright (Alfreton). Large Catfish: 1, B. Phillips (Ashton); 2, L. Kaye (Top Ten); 3, A. G. Esteves (Top Ten). Small Catfish: 1, A. Newall (Glossop); 2, B. Thompson (Gorton and Openshaw); 3, R. Davies (Belle Vue). Loaches: 1 and 3, T. and W. (Sunnybrow); 2, F. Mulla (Merseyside). Fighters: 1, D. Trace (Ashton); 2, B. Seabright (Gorton and Openshaw); 3, J. Gesty (Sunnybrow). Anabantids (Large): 1, Mr. and Mrs. Brown (Mixerden); 2, A. Middleton (Sunnybrow); 3, F. Mulla (Merseyside). Anabantids (Small): 1, A. G. Esteves (Top Ten); 2, J. Bowyer (Top Ten); 3, Mrs. Cobb (T.A.B.). A.O.V. Tropical: 1, D. Moorcroft (Merseyside); 2, D. Thomalla (Merseyside); 3, J. Gesty (Sunnybrow). Tropical (Egglayers) (Pairs): 1, R. Davies

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(Belle Vue); 2, D. Wright (Alfreton); 3, J. Murray (Salford). Tropical (Livebearers) (Pairs): 1, J. Greedy (Sunnybrow); 2, R. Tomkinson (Glossop); 3, A. Wild (Salford). Coldwater: Goldfish and Shubunkins: 1 and 2, E. W. Eton (Sheffield); 3, Mr. and Mrs. Wright (Alfreton). A.O.V.: 1, Mr. and Mrs. Wright (Alfreton); 2, E. W. Eton (Sheffield); 3, W.P.S.C. (Oldham). Pairs: 1, E. W. Eton (Sheffield). Juniors: Egg-layers: 1, P. Hodgkinson (Gorton and Openshaw); 2, D. Moorcroft (Merseyside); 3, J. Watson (Sunnybrow). Livebearers: 1, D. Slater (Sunnybrow); 2, Miss L. Boswell (Top Ten); 3, S. Smith (Merseyside). Mini-Jars: 1, Mrs. A. Heap (Heywood); 2 and 3, K. G. Daniels (Merseyside). Breeders: 1 and 3, Mrs. Cobb (Tab); 2, R. Moorcroft (Merseyside).

A GENERAL talk on plants was given to members of the Harrow A.S. by Mr. Forder of the Underage Society at the first meeting in April. To illustrate the points covered in his talk Mr. Forder showed some very good slides which included plants in his own fish house and some experiments that he had conducted over the years. Various samples of the plants mentioned were brought along and shown to the meeting.

At the second meeting of the month Roy Eggs judged a Table Show consisting of Catfish, Labyrinth Loaches, the results of which were as follows: Catfish: 1, Mr. Hemstall; 2, Mr. Bong; 3, Mr. Seaman. Loaches: 1, Mr. Beckwith; 2, Mr. Bong. Labyrinth: 1, Mr. Nobes; 2, Mr. Moeris; 3, Mrs. Bong. This was followed by an informal talk on an aspect of the hobby which Mr. Eggs had obviously studied a great deal—Corydoras Catfish. During his talk he circulated some excellent "home made" drawings to help distinguish the different species of Corydoras Catfish.

At the April meeting of the Aireborough and District A.S. there were forty-two members present, to hear a lecture by Mr. K. Bateman, a very interesting talk on food and feeding. Also this month Aireborough held an inter-society show with most Yorkshire societies taking part with Aireborough finishing first and Keighley second in a very good show. The monthly table show results were as follows: Guppies: (Advanced): 1, R. Taylor; 2, G. Monk; 3, Mr. and Mrs. H. Robinson. (Novice): 1, J. Marshall; 2, J. Stretton; 3, K. Marshall. (Junior): 1, Master A. Fleisher; 2, Master M. Robson. Egg-Layer Pairs (Advanced): 1, J. Kay; 2 and 3, Mr. and Mrs. J. Robinson. (Novice): 1 and 2, B. Tate; 3, J. Stretton. (Junior): Master A. Stretton; Master A. Fleisher. Best in Show: R. Taylor.

The Warrington A.S. had a lecture recently from J. H. Turner on Breeding the Neon Tetra. He explained in detail his preparations, i.e., water, temperature, the two tanks system, selection of breeders, conditioning the fish. As a few members are attempting to breed the neon, this talk proved to be very interesting. It is hoped that from information given in the lecture that the members will now meet with success in attempting to breed this delightful little fish.

The Fish of the Month Competition was for Angels, Dwarf Cichlids and Large Cichlids: Angels: 1, B. Philcox; 2, R. Reedy; 3, D. Healey. Large Cichlids: 1, L. Crawford (trophy); 2, J. Higham; 3, M. Baker. Dwarf Cichlids: 1, J. Higham; 2, B. Bewick; 3, A. Addison.

The Society is now arranging a table show with Illesmere Park, who have challenged the club, with a return show. The results will be published at a later date.

The April issue of "Lateral Lines"—journal of the York and District A.S. contains some interesting aquatic news and club notes. The Society has been invited to install and maintain a tank in the junior section of the library.

THE April meeting of the Barton and District A.S.

created a diversion from aquatic subjects on which the programmes are normally based. This new departure came as a result of Mr. J. Foden accepting an invitation to lecture on "Reptiles". Mr. Foden, one time curator of reptiles and fish at Dudley Zoo, is now head-keeper at Drayton Manor Park and his vast knowledge of reptiles together with the live specimens which he brought along provided a night of immense interest.

The results of the table show for Anabantids were: 1, T. Bowler; 2, R. Walker; 3, N. Fearn, and B. Poinson; 4, B. Forman. Meetings are held on the second Thursday of each month at the Fox and Goose, Beidge Street, commencing at 7.45 p.m.

ENTRIES for Keighley A.S. show at nearly 350 were more than double last year's number. Another pleasing feature of the show was the increase by 700 in members of the public who attended. The prize for the best fish in the show was won by a red Piranha owned by J. A. Whiteley, of the Aireborough A.S. with 86 points out of 100.

Results: Guppies: 1, Master Greenwood (Halifax); 2, Mr. Blamires (Huddersfield); 3, R. Taylor (Aireborough). Swordtails: 1, Mr. Burrop (Keighley); 2, Master Greenwood; 3, Mr. Greedy (Sunnybrow). Mollies: 1, Mr. Bickle (Keighley); 2, Mr. Greedy; 3, Mr. Whiteley (Aireborough). Platies: 1 and 3, Mr. Kennedy (Bradford); 2, Mr. Buckstone (Barnsley). Barbs over nigger: 1 and 2, Mr. Buckstone; 3, Mr. Reynolds (Swillington). Barbs over nigger: 1, Mr. Whiteley (Aireborough); 2, R. and D. Standen (Layne); 3, H. Smith (Keighley). Characins: 1, Mr. Buckstone; 2, Mr. Greedy; 3, Mr. Walker (Sheffield). Characins over 3 in.: 1, Mr. Whiteley; 2, Mr. Monk; 3, Mr. and Mrs. Robinson (Aireborough). Carp and minnows: 1, Mr. Kay (Aireborough); 2, Mr. White (Keighley); 3, Master Mosley (Keighley). Shark and foxes: 1, Mr. Gates (Castleford); 2, Mr. Gibson (Huddersfield); 3, Mr. Walker. Fighters: 1, Mr. Bycroft (Top Ten); 2, Mr. Tattersall (Keighley); 3, Mr. Smith (Keighley). Anabantids: 1, Mr. Whitelock (Tadcaster); 2, Mr. Healey (Barnsley); 3, Mr. Tong (Oldham). Dwarf cichlid: 1, Mr. Taylor (Aireborough); 2, Mr. Greedy; 3, Mr. Walker. Large: 1, Mr. Carey (York); 2, Mr. Kennedy (Bradford); 3, Mr. D. and R. Slender (Layne). Catfish: 1, Mr. Reynolds; 2, D. Smith (Tadcaster); 3, Mr. Hampson (Horsforth). Loaches: 1, Mr. Holdsworth (Bradford); 2, Mr. Bickle; 3, Mr. Walker. Any other variety: 1, Mr. Whitelock; 2, Mr. Carey; 3, Mr. Greenhall (Tadcaster). Breeders (live): 1, Mr. Healey (Barnsley); 2, Mr. and Mrs. Robinson (Aireborough); 3, Mr. Thickson (Castleford). Breeders (egg-layers): 1, Mr. Buckstone (Barnsley); 2, D. Smith (Tadcaster); 3, Mr. and Mrs. Robinson. Pairs (live): Mr. and Mrs. Robinson; 2 and 3, Mr. Gardner (Aireborough). Pairs (egg-layers): 1, Mr. Whiteley (Aireborough); 2, Mrs. Whitfield (Keighley); 3, R. and D. Slender (Layne). Fancy goldfish: 1 and 2, Mr. Moorhouse (Bradford); 3, Mr. Town (Castleford). Common goldfish: 1, Mr. Town; 2, Mr. Moorhouse (Bradford); 3, Mr. White (Keighley). Any variety cold water: 1, Mr. Hooper (Bradford); 2, Master Cordingley (Keighley); 3, Mr. Tong (Oldham). Juveniles: 1, Master Rhodes (York); 2, Master Harris (Keighley); 3, Master Taylor (Keighley).

At the March meeting Keighley A.S. held a show attended by over 50 members. They included several new members. Entertainment for the evening was an excellent slide show presented by Mr. Hampson, of Horsforth. The slides were in colour and showed rare fish. Mr. Hampson gave a commentary. Winners were: Table class: 1, Mr. Bickle; 2, Mr. Dearnley; 3, Mr. Pickles. Any other variety: 1, Mr. Bickle; 2, Mr. Dearnley; 3, Mr. Asquith. Novice class: 1, Mr. Liddeknow; 2, Mrs. Bickle; 3, Mr. Crossley. Junior class: 1 and 3, Master Taylor; 2, Master White.

THOSE elected at the annual general meeting of the Rothampton A.S. were as follows: Chairman, J. A. Waller; Treasurer, P.

Furniss; Committee, D. Lambourne and A. Morgan; Secretary (Show), J. Hughes; Secretary, V. E. Thompson, 93, Adney Road, London, W.6. The Secretary will be pleased to supply further information regarding the Club.

A TOTAL of thirty-two members attended the April meeting of the Amesbury and District A.S. The evening commenced with the Chairman, M. Sainsbury, opening a short meeting. A decision was reached on the new Society's badge, the information given that the Society was now members of A.S.A.S. and F.H.A.S. and the idea of a junior section discussed.

A taped lecture entitled "Aquarium Management" followed while the bottle show was being judged. The first bottle show of "Any Variety Fish" brought a good response. The results were: 1, I. Sainsbury; 2, J. A. Housborn; 3, R. S. A. Harvey; 4, M. Sainsbury.

THE monthly newsletter of the Wellingborough and District A.S. for May, although including an editorial complaint regarding lack of letters and articles from members, still contained quite an amount of club news and notes of interest to members and other readers alike. There is also particular of a not so fantastic idea of the club opening its own Aquarium shop.

THE officers elected at the annual general meeting of the Hertsford A.S. were: Chairman, R. Hargrove (and also editor); Treasurer, M. Pollard; Secretary, Mrs. B. Helm; Show Secretary, Miss J. Helm. After all the business was finished with the Chairman gave a slide show from "Queenland", all about the Barrier Reef. Some beautiful coloured marine fish were seen and also the wonderful colours of the different corals and star fishes.

The specified class was Furnished Jars and the results were: 1, W. Audley; 2, Master J. Dugdale; 3, Miss J. Dickinson. A.O.V.: 1, Mrs. J. Dickinson; 2, Mrs. P. Hall; 3, R. Lancaster. A.O.V. junior: 1 and 3, Master N. Holmes; 2, Master J. Dugdale. Best in Show: Mrs. J. Dickinson, with a black cold water catfish.

THE new Secretary of the Independent A.S. is M. Harth, 60 Liverpool Road, Ilington, London, N.1. Other officers of the Society are: President, F. Tomkins; Chairman, G. Dickson; Treasurer, J. Kettle; Show Secretary, T. Islip; Assistant Show Secretary, T. Beaumont; P.R.O., A. Scudler. The Society meets each Monday at 8 p.m. at the Holloway Institute, Barnsbury Secondary School, Eden Grove, Holloway, N.7.

THE April meeting of Tonbridge and District A.S. was its first annual general meeting. Despite a good beginning the committee is certain it can produce a programme of a high enough quality to give an added stimulus to the hobby in this area. The following officers were re-elected: Chairman, D. Allen; Vice-Chairman, J. Bellingham; Treasurer, R. Baker; Secretary, I. Mathison, 33 Norton Way, Five Oak Green, Tonbridge, Kent; E. Horsley was elected as Show and Social Secretary and Messrs. L. Getley and R. Taylor were appointed to the committee.

A RECORD attendance of eighty was present at the April meeting of the Harlech A.S. when the guest speaker was Malcolm Delingpole of the Birmingham Fancy Guppy Association. In addition to presenting a lecture on the theme "The Breeding and Keeping of Fancy Guppies" Mr. Delingpole also elected to judge the evening's table show. Class results were: Guppies (female): 1, Master C. Brooks; 2, A. Ward; 3, R. Hoare; 4, P. Garner. Guppies (male): 1, 3 and 4, P. Garner; 2, R. Hoare.

Several members of the Society were recent exhibitors at the Bath Open Show, award cards being taken by three members: P. Garner, R. Wilkie and A. Payne.

Meetings of the Society are held on the third Tuesday of each month at the Galsilla Junior School, Colwell Road, Cardiff (7.30 p.m.). Prospective members are most welcome to attend, and further details, if required, are obtainable from the Secretary, M. J. Parry, 57 Casau Court Road, Ely, Cardiff.

THE Hastings and Bexhill A.S. recently attempted their first Killifish table show, judged by R. C. Armstrong of Farnborough. The show resulted as follows: 1 and 3, P. Martin; 2, G. Fryke. Mr. Armstrong spoke to the club on Killies and explained about every aspect associated with them. He brought along many varieties to illustrate his talk.

EARLY in April the **East Dulwich A.S.** held their first open show. There were twenty-one classes which totalled 428 entries and also 62 Guppy entries which were judged by the Fancy Guppy Association.

The following were the results: Molliés: J. Wilson; Platies: D. Smith; Swordtails: K. Dryden; A.O.V. Livebearers: M. Clarke; Characins: A. Blake; Barbs: A. Blake; Fighters: R. Wynd; A.O.V. Labyrinth: F. Kendrick; Cichlids: J. Stillwell; Rasboras Danios and White Cloud Mountain Minnows: A. McCarthy; Egg-laying tooth-carp: J. Randall; Corydoras: Mrs. Lippert; A.V. Loach and A.O.V. Catfish: F. Kendrick; A.O.V. Igglayers: A. Blake; Breeders (Igglayers): L. Little; Breeders (Livebearers): L. Little; C. Goldfish and London Shubunkins: V. Versey; Singletail Goldfish and Cornies: R. Dudley; A.O.V. Fancy Goldfish: R. Dudley; A.V. Native or Foreign Coldwater: J. Stillwell; Rooted Plants: G. Greenhalf.

Special Awards were: The E.D.A.S. Cup and 'Aquarist' Gold Pin—awarded to J. Wilson for the Best Fish in the Show (Veilfish); The F.I.A.S. Trophy to R. Wynd for the Best Fish; The 'Dulwich Bowl' to J. Stillwell for the Best Cichlid (Texas Cichlid); The Castle Cup to Mrs. Lippert for the Best Corydoras (C. Paleatus).

THE Smethwick and District A.S. held their Annual General Meeting on 23rd April and voted into office the following officials: President: I. Stokes; Chairman: D. Johnson; Vice-Chairman: G. Wynn; Secretary: D. L. Black, 27 Murdoch Place, Windmill Lane, Smethwick, Walsley, Worcestershire; Treasurer: J. Harris; Show Secretary: J. Hodgkiss; Newsletter Editor: R. Welsh; Committee Members: Mrs. E. Ainge, Mrs. D. Shepard, F. Smith.

The month of April proved a busy one on the show bench, for **Ealing and District A.S.**

At the first meeting of the month, not only was there the usual monthly table show, this time Cichlids and Characins, but also the first round of the Jim Irvine Trophy. This is a new competition in the club, in which previously nominated fish are shown at regular intervals throughout the year, the highest total winning the Trophy; the response was gratifying, over 40 entries being benched! The results were: Cichlids: 1, P. Woodward; 2, A. Ankin; 3, T. Tagg; Characins: 1, A. Ankin; 2, G. Ankin (junior member); 3, G. Bryggin; 4, J. Healey.

Brent A.S. were the guests at the second meeting, and the first round of the twice yearly inter-club table show was held. Revenge was taken for both last year's defeats, Ealing winning by 43 pts. to 12 pts. Slides provided by S. Harmon were shown, accompanied by a very capable improvised commentary from Ealing Vice-Chairman A. Ankin.

Ealing v. Brent results: Cichlids: 1, T. Tagg (E); 2, D. Church (E); 3, P. Woodward (E); 4, P. Shrimpton (B). Barbs: 1, J. Healey (E); 2, J. Raymond (B); 3, A. Ankin (E); 4, R. Fox (E). Labyrinth: 1, R. Savage (E); 2, A. Ankin (E); 3, R. Barrett (E); 4, P. Shrimpton (B). A.O.S. (Egglayers): 1 and 2, R. Sellers (E); 3, T. Tagg (E); 4, P. Shrimpton (B). Best Fish in Show: Roxy Barb: J. Healey (E).

THE following is an extract from information recently received from **Hendon and District A.S.**

"Hendon are pleased to see that many other societies are following in our footsteps by producing tape and slide programmes for fellow clubs.

"We are pleased to announce that, beside our current programmes for hire, we have produced some more that are now available. Please write to our Services Secretary for details: Mrs. Patricia Gorman, 341 Honeyport Lane, Staines, Middx. Pat loves to receive and write letters, to write soon. Pat's husband, Joe (our ex-Show Secretary) has just succeeded in spawning his Discus and also photograph them (in colour) actually spawning. Joe, to boot, is a brilliant photographer, and we are currently producing a new tape and slide programme in which some of these superb pictures will be shown."

On the competitive side Hendon recently visited Hampton and District A.S. who were host for the first round of the year of the North West London Group of Aquarist Societies Competition. The pointing for the evening was Hendon 22, Independent 13, Brent 13, Riverside 9, Hampton 6.

ASSUMING membership increases at the same rate as it has been doing recently, the **International Marine Study Society** are making plans to welcome their 500th member sometime between July and October this year. The lucky member concerned will not only receive full free membership of the I.M.S.S. for a period of one year, but will also be presented with a complete marine aquarium which is to be donated to the Society for presentation, by Mr. G. H. Jennings, one of the co-founders of I.M.S.S. in 1965.

Last month saw the first colour print appearing in the I.M.S.S. journal, and it has been followed this month by a full page monochrome photograph. The I.M.S.S. slide lecture has been given to the following Societies since January, 1969: Harlech (Cardiff) A.S., Basildon A.S., Peterborough A.S., Bourne-mouth A.C., and Southend and District A.S. Societies are cordially reminded that the slide lecture is available for experts only and can be booked at seven days' notice. All information on I.M.S.S. slide activities is available from: I. B. Clarke, director I.M.S.S., 46 Park Avenue, South Harnsey, London, N.8, or from I.M.S.S. General Secretary, T. R. Hall, 49 Broadhurst Gardens, London, N.W.6. Enquiries for individual U.K. membership should be made to K. Martin, 9 Lennox Drive, Wilcot, Swindon, Wilts.

ENTRIES for the second Open Show of **Thurrock A.S.** numbered 454 and over twenty societies entered. The results were:

Guppy (male): 1, S. T. Norris (Southend); 2, K. Passmore (Southend); 3, D. C. M. Durrant (Thurrock); 4, Mrs. B. D. Greenhalf (Kingston); Guppy (female): 1, L. Goff (F.C.A.); 2, Mrs. J. Norris (Southend); 3, S. T. Norris (Southend); 4, Mrs. R. D. Greenhalf (Kingston). Molliés: 1, D. Cheswright (Southend); 2, J. D. Wilson (Cardiff); 3, J. Stewart (L.T.H.); 4, H. R. Nicoll (Thurrock). Platies: 1, R. Steenberger (Bethnal Green); 2, J. Devall (Blackwater); 3, D. Cheswright (Southend); 4, H. S. Wood (Croydon). Swordtails: 1, F. E. T. Smith (Cardiff); 2, B. E. Mason (Independent); 3, B. T. Mather (Walthamstow); 4, T. Gillman (Bethnal Green). A.O.V. (livebearer): 1, M. Clark (Kingston); 2, E. Gee (Blackwater); 3, A. Blake (Unattached); 4, D. Cheswright (Southend). A.S. Rasboras: 1, A. McCarthy (Cardiff); 2, J. W. Gower (Bethnal Green); 3, K. Appleyard (Thurrock); 4, G. Greenhalf (Kingston). Fighters: 1 and 3, D. C. M. Durrant (Thurrock); 2, J. Jarvis (Harlow); 4, A. Blake (Unattached). Corydoras Cats: 1, Sgt. Stamp (Unattached); 2, A. Blake (Unattached); 3, R. Strudwick (Thurrock); 4, P. O'Bryan (Thurrock). A.O.V. Labyrinth: 1 and 4, J. D. Wilson (Cardiff); 2, D. Edwards (Southend); 3, G. Greenhalf (Kingston); 4, F. E. T. Smith (Cardiff). Danios and Minnows: 1, C. Wallock (Blackwater); 2, G. Eaton (Thurrock); 3, D. C. M. Durrant

(Thurrock); 4, A. Blake (Unattached). Characins: 1, R. Kerridge (Harlow); 2, D. Edwards (Southend); 3, R. Passmore (Southend); 4, R. Nield (Southend); R. Offord (Southend); J. Gower (Bethnal Green). A.O.V. Cichlid: 1, D. C. M. Durrant (Thurrock); 2, R. Passmore (Southend); 3, G. Greenhalf (Kingston); 4, R. Nield (Southend). A.V. Barb: 1, J. E. Bellingham (Tonbridge); 2, S. Mooney (Tottenham); 3, M. A. Jones (Elyth); 4, W. C. Green (Suffolk). A.V. Angel: 1, P. Todd (East Dulwich); 2, B. T. Mather (Walthamstow); 3, J. Stewart (L.T.H.); 4, S. Baker (Unattached). E.C.T.C.: 1, D. C. M. Durrant (Thurrock); 2, Mr. Morgan (Harlow); 3, B. G. Dunn (Southend); 4, D. Cheswright (Southend). A.O.V. Catfish: 1, A. J. Clark (Medway); 2, B. F. Mason (Independent); 3, B. G. Dunn (Southend); 4, G. Greenhalf (Kingston). R. Kerridge (Harlow). Sexed Pairs: 1, J. D. Wilson (Cardiff); 2, C. Wood (North Kent); 3, Mrs. R. D. Greenhalf (Kingston); 4, R. J. Baker (Tonbridge). Cichlid (Dwarfs): 1, B. G. Dunn (Southend); 2, V. C. Green (Suffolk); 3 and 4, H. S. Wood (Croydon). A.O. Species (tropical): 1, A. Collings (Bethnal Green); 2, R. Kerridge (Harlow); 3, R. Wallings (Southend); 4, Mrs. J. Bellingham (Tonbridge). W.G.H. Card (Suffolk). Igglayers (breeders): 1, G. Eaton (Thurrock); 2, A. McCarthy (Cardiff); 3, V. C. Green (Suffolk); 4, F. Vickers (East London). Livebearers (breeders): 1, T. Gillman (Bethnal Green); 2, F. W. Smith (Walthamstow); 3, D. C. M. Durrant (Thurrock); 4, E. Gee (Blackwater). Furnished Aquaria: 1, K. Appleyard (Thurrock); 2, D. C. M. Durrant (Thurrock); 3, Mrs. J. Twiss (Walthamstow); 4, R. Strudwick (Thurrock). Best Breeders (E. R. Nicoll Trophy): T. Gillman (Bethnal Green). Best Livebearer (Essex Cup): D. Cheswright (Southend). Best Catfish, Loach or Eel (D. C. M. Durrant (Southend)). A. J. Clark (Medway). Best Characin (President's Shield): R. Kerridge (Harlow). Best in Show: P. Todd (East Dulwich). Best Egglayer (Thurrock Cup): P. Todd (East Dulwich). Best Labyrinth (Appleyard Trophy): J. D. Wilson (Cardiff). Top's Trophy: 1, Thurrock; 2, Southend; 3, Cardiff; 4, Bethnal Green.

A SHOW competition and social league has been formed between **Roehampton, Hounslow, Kingston and Runnymede Aquarists Societies**, and is to be known as the R.H.K.H. League. The League held its first meeting on the 18th April at which Hounslow were the host club. Bob Nelhams, Hounslow's Social Secretary, did an able job and arranged social events that were enjoyed by all and made the afternoon a huge success.

The classes of fish competed for were, Barbs, Cat Loach and Botia, and Livebearers. The results were as follows: Barbs: 1 and 3, R. Brewer (Hounslow); 2, Mrs. Fairhurst (Kingston); 4, Mr. Richardson (Runnymede). Cats, Loach and Botia: 1, G. Greenhalf (Kingston); 2, A. Morgan (Roehampton); 3, R. Jayes (Runnymede); 4, R. Brewer (Hounslow). Livebearers: 1, K. Clark (Kingston); 2, D. Norman (Runnymede); 3 and 4, G. Greenhalf (Kingston).

The points position is: Kingston 14 pts., Hounslow 7 pts., Runnymede 6 pts., Roehampton 3 pts.

AT the April meeting of the **Iford and District Aquarist & Pondkeepers' Society** members took part in a club auction of fish, plants and equipment.

An interesting selection of fish were on display for the monthly table show and the winning entries in three classes were as follows: A.V. Characin: 1, A. Hunt; 2, W. Rowe; 3, Mr. Forrester; 4, Mrs. F. Read. A.V. Plarie: 1, D. Seaman; 2, A. Hunt. A.V. Fancy Goldfish: 1, 2, 3 and 4, D. Woodley.

The next two meetings of the Society will be held on Monday evenings, 9th June and 14th July, when the programmes, which will all include table shows, will be a talk on aquatic plants by Bernard Pye, the annual general meeting and a talk by a professional aquarist.

Albert Villiers respectively. Anyone interested will be welcome and may obtain further information from the Hon. Secretary, Ron Ruth, 103 Heath Road, Chadwell Heath, Romford, Essex.

THE results of Stockton-on-Tees A.S. Fourth Open Show were as follows: Furnished Aquaria: L. Collins, Furnished Jars: G. Scarth, A.V. Fighter; D. Keighley, A.O.V. Labyrinth: K. Dodd, A.V. Cichlid (Large): W. Bowman, A.V. Dwarf Cichlid: Mr. and Mrs. Gennett, A.V. Barb: Mr. and Mrs. Gennett, A.V. Characin: C. Buck, A.V. Platy: L. Collins, A.V. Sweettail: B. Walls, A.V. Molly: J. Turnbull, A.V. Guppy: K. Hickford, A.V. Scavenger: L. Collins, A.V. Egglayer, Tooth Carp: G. Scarth, A.V. Rasbora Danio: H. Walk, A.O.V. Fish: D. Keighley, A.V. Breeding Pairs (Egglayers): B. Walls, A.V. Breeding Pairs (Livebearers): T. Walls, Breeders Class (Egglayers): G. Scarth, Breeders Class (Livebearers): J. Turnbull, A.V. Coldwater: K. Hickford, Junior Class: M. Black, Best Fish in Show: Callitriche Callitriche: Shown by L. Collins.

THE Cambridge and District A.S. Open Show which was to have been held in June has been postponed until the 27th and 28th September.

AT the April meeting of Southampton and District A.S. Mr. J. Jeffery gave an illustrated lecture on Barbs as well as judging a table show of that species. The prize cards were all won by Mr. and Mrs. Russell and Mr. Gilbert.

A letter in the local evening paper concerned with goldfish disappearing from a reader's pond was discussed during Question Time. Many reasons for, and remedies to prevent any further disappearances were forthcoming. The Chairman said he had already contacted the troubled reader who had obviously overlooked the Club's services.

NEW SOCIETIES

A new Aquatic Society was formed by the Warwick County Fire Brigade. The first meeting was held on Monday, 21st April, and it was agreed by 22 members present that because the fire station was to be used for the meeting that the name of the brigade should be in title. It was agreed by all that it should be abbreviated and was accepted as "W.C.F.B. Aquatic Society".

The following were elected to the committee. Chairman: R. J. Healey; Secretary: P. J. Black; Treasurer: R. K. Brindley; Committee members: I. Mathews, R. Tromans, R. Orme. The meetings are to be held on the second Monday in the month.

An aquarist society has been formed in Milford Haven. The name of the society is "The Haven Aquarists Society". Meetings are held on the second Monday of each month. Correspondence from other Societies welcomed. Details of membership, etc., can be obtained from Temporary Secretary, Haven Aquarist Society, W. D. Watlow, 55 Observatory Avenue, Hakin, Milford Haven, Pembro.

SECRETARY CHANGE

Bournemouth A.S.: R. Matley, "Vanessa," 2 Dean Swift Crescent, Lilliput, Poole, Dorset.

AQUARIST CALENDAR

1st June: The Fourth International Guppy Show organized by the Fancy Guppy Association of Great Britain will be held in the Drill Hall, 3 Stretford Road, Manchester. Open to the public on Sunday, 1st June from 10 a.m. till 4 p.m. Admission free. Further particulars re benching, prizes, etc., may be obtained on request from Hon. Secretary: F. Campbell, 37 Cardigan Street, Bury, Lancs. S.a.e. with enquiries.

7th June: Yeovil and District A.S. Show Secretary, K. Blake, 13 Glenville Road, Yeovil.

8th June: Stretford and District A.S. Open Show, A.E.I. Club, Moss Road, Stretford.

8th June: Lincoln and District A.S. Open Show. Show schedules available from E. Cassidy, 56 Hollywell Road, Cliff Gardens, Beart Road, Lincoln.

8th June: Glossop A.S., The Adult Education Centre, Talbot Road, Glossop, Derbyshire. Schedules, etc. from The Secretary, D. R. Chambers, 86 Old Road, Hyde, Cheshire.

8th June: Loughborough and District A.S. Second National Open Show, Town Hall, Market Square, Loughborough. Schedules will be available later from the Show Secretary, I. Purdy, 61 Poplar Road, Loughborough, or from the Secretary, Fred Hopewell, 61 Morley Street, Loughborough, Leicestershire.

8th June: Priory A.S. First Open Show at Boy's Club, Mariners Lane, North Shields, Northumberland. Schedules and full details can be obtained from D. Holman, 41 Beresford Road, Tynemouth, Northumberland.

14th June: Southampton and District A.S. Open Show at St. Denny's Church Hall, Southampton. Details from Show Secretary, C. McCann, 7, Waterhouse Way, Southampton, SO1 3PA.

14th June: Llantwit Major A.S. Annual Open Show in the Llantwit Major Town Hall.

15th June: Brighton and Southern A.S. Open Show, Marmion Centre, Marmion Road, Hove. Schedules can be obtained from R. Browning, 34 Rowan Close, Portlady, Sussex.

15th June: Swillington A.S. Open Show, will be held at Swillington County Primary School, Church Lane, Swillington nr. Leeds. Schedules are now available from the Show Secretary, W. R. Gawthorne, 6 Manston Lane, Leeds, 15, Yorks.

21st June: Bracknell A.S. Annual Open Show, at the Priorswood Community Centre, Priorswood Court Road, Bracknell. Show Secretary: Mr. Len Little, 126 Shepherd's Lane, Bracknell.

22nd June: Salisbury and District A.S. Fifth Open Show. Details from Show Secretary, R. Brown, 20 St. Birinus Road, Woodfalls, Nr. Salisbury.

22nd June: Alfreton and District A.S. Annual Open Show, at the new Adult Education Centre, Alfreton Hall. Details from Show Secretary, Mr. S. Hill, 35 South Street, Ruddings, Derbyshire.

22nd June: Open Show Coventry Pool and Aquarium Society, at Foleshill Community Centre, Foleshill Road, Coventry. Schedules from C. J. Grant, 26 Cecily Road, Coventry.

26th-28th June: Bristol Tropical Fish Club. Open Show, Congregational Church Hall, Newton Street (off Stapleton Road, Bristol 5. Details from I. Newman (show secretary), 71 Somerdale Avenue, Knowle, Bristol 4.

26th June: Medway A.S. Further details to follow.

29th June: Medway A.S. Third Annual Open Show at St. John Fisher School, Ordinance Street, Chatham. Show Secretary, C. A. Craft, 75 Dargets Road, Walderslade, Chatham, Kent.

6th July: Leamington and District A.S. 4th Annual Open Show.

6th July: Lytham A.S. Annual Open Show, Lowther Pavilion, Lowther Gardens, Lytham, Lancs.

6th July: High Wycombe A.S. Open Show at Bovingdon Green Hall, Nr. Marlow, Bucks. Schedules available shortly from Show Secretary, Mrs. S. Thomas, Pinnamore Wood Camp, Lane End, Nr. High Wycombe, Bucks. Tel: Lane End 659.

6th July: Tadcaster A.S. Open Show at St. Joseph's School, St. Joseph's Street, Tadcaster. Details and schedules from Show Secretary, J. W. Holmes, Newsagent, Collingham, Wetherby.

6th July: Northwich and District A.S. First Annual Open Show at the Scout Hall, Cuddington, Nr. Northwich, Cheshire. Full details from Show Secretary, C. Davies, 70 Hayhurst Avenue, Middlewich, Cheshire.

6th July: Leamington and District A.S. Fourth Open Show, Trinity Hall, Trinity Street, Leamington Spa. Details from P. N. Thomas, 199 Brunswich Street, Leamington Spa, Warwick.

10th-13th July: Aquarist and Pondkeeper Open Show, Alexandra Palace, London, N.22.

12th July: Basingstoke Open Show incorporating the Three Counties and Three Counties Section F.G.B.S. Shows, to be held at the Carnival Hall, Basingstoke. Details from Show Secretary, A. Blake, 90 Bounty Road, Basingstoke.

12th July: Newport A.S. Open Show at St. John Parish Hall, Victoria Avenue, Maidenhead, Newport, Mon. Full details available from I. G. Phillips, Show Secretary, 34, Brangwyn Crescent, Newport, Mon. NPT:7 QY.

12th, 13th July: Romford and Becontree A.S. Dagenham Town Show. Enquiries to Mr. Fyne, Show Secretary, 3, Ashvale Drive, Cranham, Upminster, Essex. Tel: Upminster 28435. Schedules available shortly.

20th July: Gosport and District A.S. Third Annual Open Show at Bridgeway Community Centre. Show Secretary, K. Clough, 16 Newport Road, Gosport, Hants.

20th July: Gosport and District A.S. Third Annual Open Show.

2nd August: Hull Show. Aquarist Open Show at East Park, Holderness Road, Hull. Details from P. M. Shepherdson, 11 Beech Grove, Beverley Road, Hull.

2nd August: Stratford and District A.S. Open Show, Archway School, Pagnhill, Stratford.

9th August: East London Aquarist and Pondkeepers' Association. Annual Open Show.

9th-16th August: Portsmouth A.S. Open Show, Portsmouth Community Centre, Twyford Avenue, Portsmouth. Open to the public from 11th August. Show schedules and information obtainable from Mr. J. Stillwell, Show Secretary, 34 Salcombe Avenue, Copnor, Portsmouth.

13th-16th August: Midland Aquatic Open Show at Bingley Hall, Broad Street, Birmingham. Show Secretary, J. Witta, 120 Franklin Road, Kings Norton, Birmingham, 30.

17th August: Bedworth A. & P.S. First Open Show at St. James Parish Hall, Bulkington, Nuneaton, Warwickshire. Schedules from M. Lee, 57 Grant Road, Ethall, Coventry, Warks.

24th August: Oram A.S. Open Table Show, Recreation Hall, Refuge Street, Shaw, Oldham.

STOLEN

As we go to press we hear that the premises of Shirley Aquatics were burgled, and approximately fifty Japanese Carp were stolen. The fish were 4'-5", colours varying—tri-colours, metallic shiny fishes, gold and yellow shiny fishes. Any information regarding these fish should be supplied to Shirley Aquatics or direct to the local police.