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The Editor accepts no responsibility for views expressed by contributors.

Contents

Aquarist unique

Mr. John Mitchell of Sheffield

A Civic Aquarium and one of the largest tanks in the country is now under construction at the Castle Square concourse, Sheffield.

The tank, made from fibre glass, has a volume of 144 cu. ft., but only has a viewing panel of approximately 8 ft. by 2 ft. 6 in. through which visitors will be able to view the aquascape. Initially the tank will be stocked with smaller specimens among which will be 850 Neon Tetras and 40 Kissing gouramies. Naturally several gigantic problems are facing the man looking after the venture, Mr. John Mitchell, firstly the cleaning of 11 cwts. of gravel, 4 cwts. of blue slate and 4 cwts. of sandstone. Having got this cleaned, sterilised and in position it will be necessary for Mr. Mitchell to don swimming trunks to prepare the aquascape and get the plants into position for there will be no other means of reaching the bottom. A most interesting feature is that lighting will be provided by means of three Gro-Lux tubes, although six spot lights will be used "to aid the growing of plant life".

Mr. Mitchell must be a man of boundless energy for in addition to this mammoth task he also runs a pet shop in Hillsborough and is preparing a private collection at his home which will have about a thousand 20-gallon tanks. This will be the largest private collection in the country and apart from being a wonderful sight with the thousands of fish, it will be more than a full time job for the Aquarist Unique.

Extracted from "Lateral Lines" (Journal of the York & District A.S.).

COLOUR SUPPLEMENT

in this issue

"First Steps in Fish Keeping"

PREVENTING FISH DISEASES

Simple ways of avoiding trouble

by Bill Smith

W. H. Smith (Aquatics)

Gorton, Manchester

ANY good aquatic dealer spends a considerable amount of time and money ensuring that a "diseased" fish is not sold to one of his customers. Personally, I could not attempt to guess the total number of hours spent each year doing nothing else but studying our aquariums for a sign of trouble. The keen hobbyist also takes steps to ensure that no disease is added to his or her aquarium or fish-house, and also makes sure that he or she is well covered in case of breakdown of equipment.

Let's deal with a few simple and inexpensive ways of avoiding trouble.

Buying the fish

If you are the lucky one with a fish-house, there's not much too worry about; just a check on the water (whether salted, etc.) and perhaps feeding habits (live fish, blue-bottle-eaters, etc.) and you're away.

The one-tank hobbyist, however, has to be a lot more careful. It is essential that the newcomer does not eat the rest of the community or grow large and uproot plants; or go around fin nipping and upsetting the peace of the aquarium or require special water conditions unsuitable for fish already kept.

Get advice

If new to the hobby your dealer will be only too pleased to give advice on community fish selection; *however, please help your dealer here.* Should the shop be crowded, and especially if there is only one person serving (and it may take some time giving the information you require), stand aside while the shop clears; then your dealer will be only too pleased to help you and will also be grateful for your consideration during the rush period.

Transporting the fish home

If you expect to be several hours travelling home, mention this to the dealer (it may effect the size and packing of container used). Better still, provide your own container and insulate it. A small sweet jar 4 in. sq., two polystyrene tiles (approx. cost 4d. each) cut to size and secured with a couple of elastic bands and enclosed by a polythene bag makes a cheap but effective insulated container suitable for carrying ½ doz. average size fish. (*See Fig. 1*). If handy with a hammer, saw and a few nails, one can go better still with a polystyrene lined box or there is a ready-made carrying case on the market.

Watch temperatures

If carrying tropical fish home in a polythene bag and you have purchased live *daphnia* at the same time, *never* carry the fish and *daphnia* home in the same hand as the temperatures will quickly equalise with a very chilling effect on the fish. If possible never carry fish home in the hand at all; if no container is available, take at least an old shopping bag and a piece of towel on your fishing trips. Remember these are tropical fish and a freezing winter wind will soon drop the water temperature if unprotected.

On arriving home float the fish in the aquarium for ten to fifteen minutes; but wait! Straight from a shop tank into your own pride and joy? My advice is to play

Continued on page 425

Container for transporting fish ▶

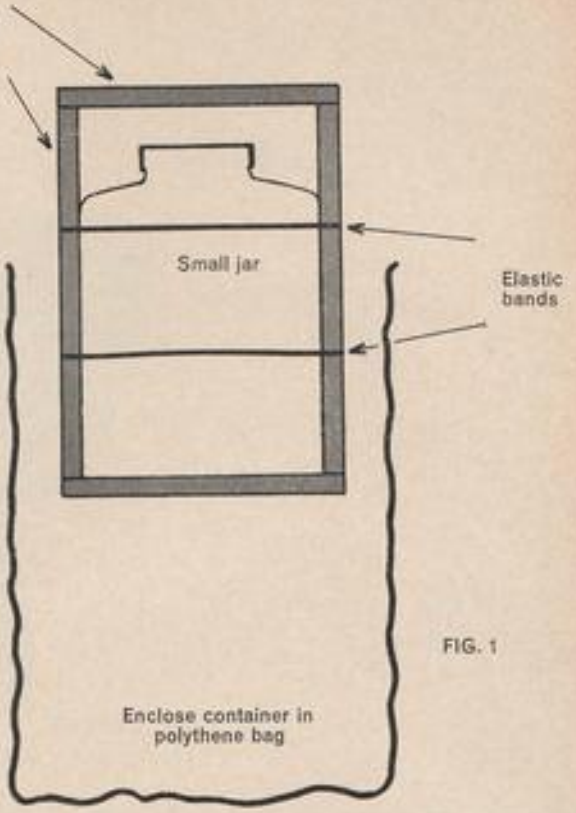


FIG. 1

Illustrations to "Preventing fish diseases" (see opposite page)

Plastic quarantine tank

12" × 8" × 8" ▼

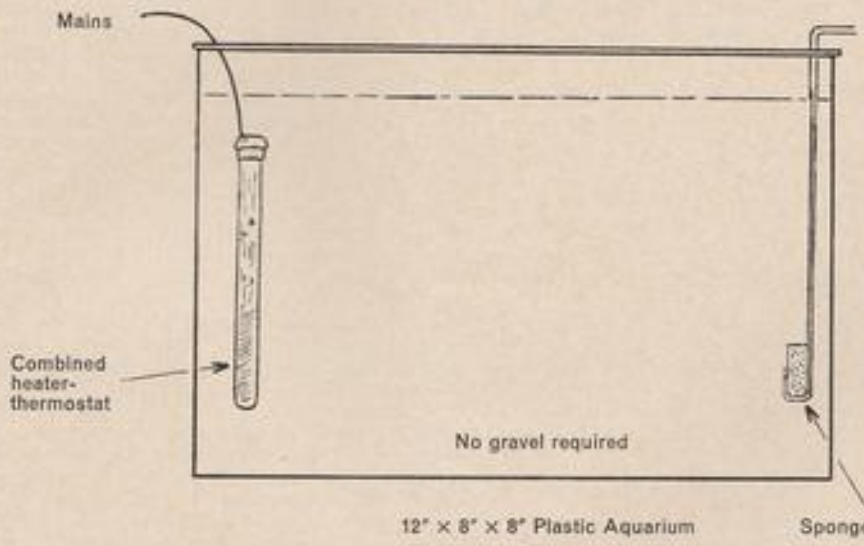
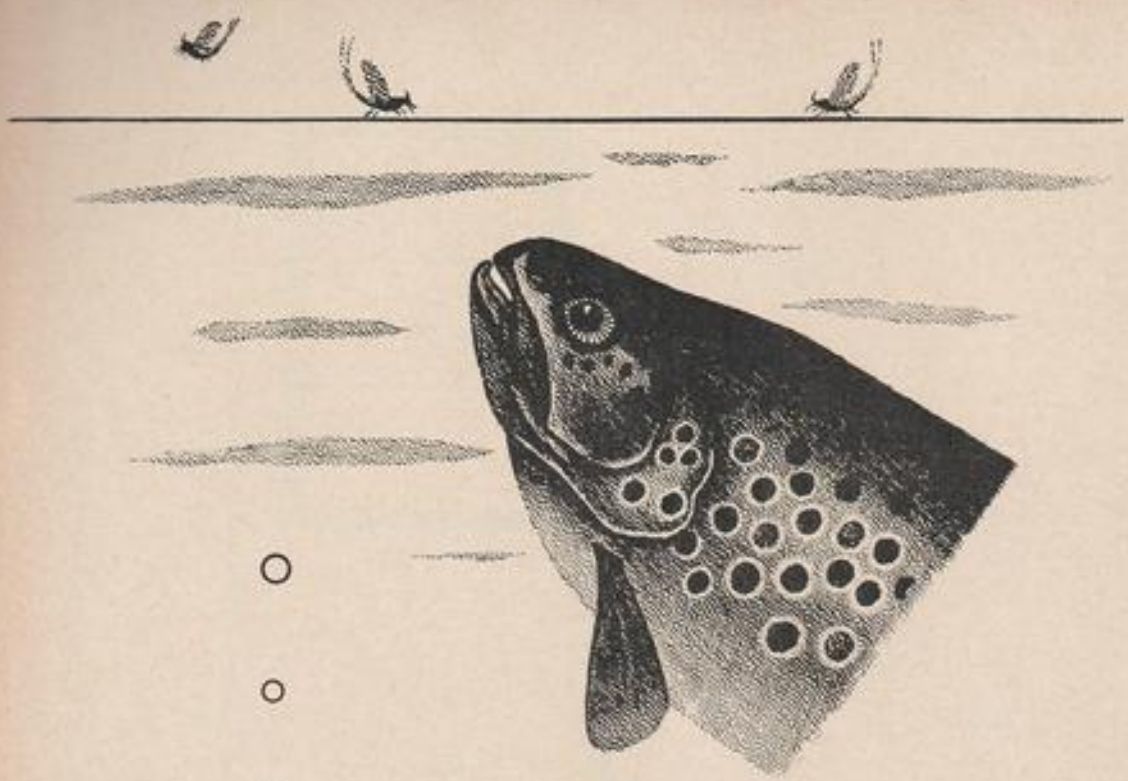


FIG. 2



MAYFLIES

by Terry Jennings

TOWARDS the end of May and in early June, nature puts on a unique spectacle that is repeated for only two or three consecutive performances each year. On a calm, warm evening, usually towards sunset, large numbers of mayflies—gauzy-winged insects with pale bodies and long trailing tails—rise and fall over the surface of the water, or cling to sedges and bushes by the shore. This spectacle, about which there are still great gaps in our knowledge, is scorned by many because of its snob-sporting associations, but one does not have to walk the keepered reaches of the trout-stream to see it. This event occurs by any stretch of permanent water—lake, river, pond, stream, marsh or even humble roadside ditch.

To the angler, the "rise of the mayfly" heralds a few days easy fishing; to the insect it represents the grand finale of a lifetime. For two years the mayflies live under water. It is not only in masses of aquatic weeds that one finds mayfly nymphs. They can be discovered burrowing in the mud at the bottom of still waters or free swimming in rapid streams. More frequently, however, the species found in streams hug the bottom closely, being equipped with strong legs and claws for this purpose, and possessing streamlined flattened bodies to more easily resist the current. Some species are found only by turning over the stones on the bottom.

The nymphal stages of mayflies are easily recognised though they exhibit some diversity of shape. The very

young nymph has no gills, but half-grown nymphs have a series of tracheal gills attached to the sides of the abdominal region, which are differently shaped in the various genera, and which therefore help in identifying specimens. All have three tails (cerci) at the hind end.

Incidentally, only one of the thirteen genera of British mayflies is believed to have nymphs that are partly carnivorous and these are quite easily distinguished by virtue of their distinctive gills. The first pair are vestigial, the second pair form a hard covering which protects the remaining four pairs of gills which are arranged in series underneath them. All other species are herbivorous, and can safely be introduced into fish aquaria when found. Remember, however, that those found in fast running water may not take kindly to static conditions. The genus most likely to be found by aquarists with small garden pools is *Chloeon*. This has free-swimming nymphs, easily caught by sweeping a net along the fringes of clumps of aquatic plants.

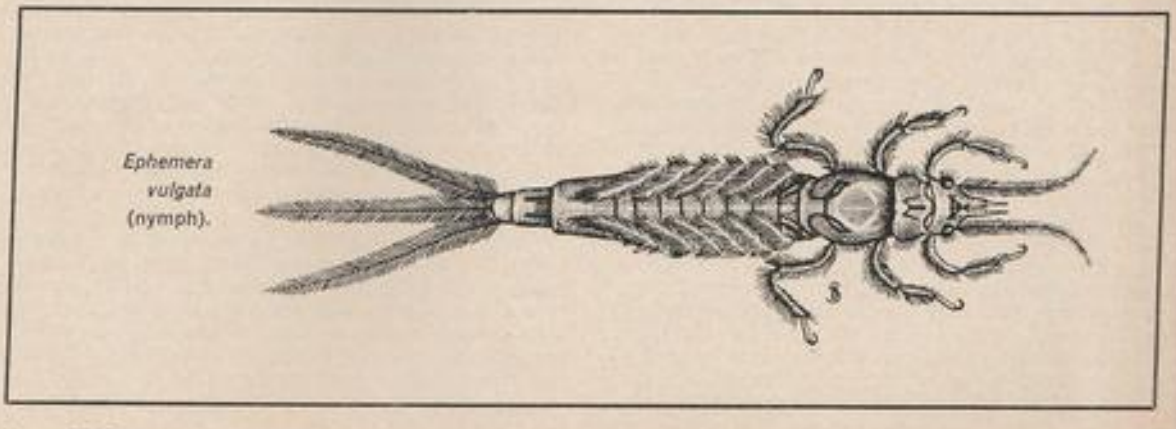
The nymphs pass through four slightly different stages during their development; in each stage they moult many times. The newly hatched nymphs breathe through the skin, but after about ten days, when they are about 1mm long, the gills begin to appear and are soon well developed. In the second spring of their lives, the budding wings are visible on the thorax in addition to the abdominal gills. The fully grown nymphs rise to the surface, buoyed up by the grass in their bodies. As they reach the light their skins split again and winged insects rise into the air. Curiously, even now the transformations are not completed. At this fourth stage the insect has lost its gills, the wings are nearly full size and functional, but it has one more moult to go through. As this final veil falls from its wings and body, the mayfly emerges—lighter in colour and weight than at first—and joins its companions in their mazy dance.

A swarm of males usually commences this ceremonial minuet, rising and falling in the air as if in obedience to some hidden conductor. At intervals a few females come from the neighbouring vegetation and join the throng. This "swarming" is a mating flight, after which the females lay their small, disc-shaped eggs.

The egg-laying procedure differs according to the species. One group dances over the water surface, repeatedly dipping the abdomen beneath the surface, releasing a number of eggs with each dip. Some rest on the water surface to do likewise. Another group of species releases all their eggs in one cluster while flying above the water, or dip their abdomens into fast running water which sweeps the eggs away. In yet another group, the females crawl down plant stems below the surface of the water, carrying an air supply with them. Selecting a suitable stone or piece of vegetation, they stick a mass of eggs on to it, and then re-emerge.

The adult flies have no mouths or tongues so that they cannot feed. As soon as the eggs are laid they begin to tire. Their flight becomes very feeble and loses its joyous undulation. One by one they sink down upon the water and their fragile wings become sodden and useless; the water boils as fish rise to snap up the spent flies and the air is filled with the cries of excited birds, eager to prey upon any of the insects still able to fly. Once again the aerial nuptials of the mayflies have culminated in a "dance of death."

Ephemera vulgata (common mayfly) image form.



Ephemera vulgata (nymph).

The bottom-feeding Burbot

Did it originate from an Atlantic sea-fish or a Continental river-dweller?

by Eric Hardy

FISH-BIOLOGISTS are anxious over a decline they fear has taken place with our only freshwater member of the cod family, the bottom-feeding burbot, which is so seldom recorded now that they fear its extinction. An attempt to map the distribution of British fishes could easily produce some misleading ideas if this were not most carefully looked into, for our rarer freshwater fish all suffer from inadequate description of their distribution in Travis Jenkins' standard work on *The Fishes of the British Isles*. His life and work was all with marine fish.

A recent article in a natural history magazine suggested that this fish inhabited rivers draining only into the North Sea, because it originated from the old Rhine watershed. It has also been declared extinct by some people and it has even been suggested that its limited distribution is confined to East Anglia. In an effort to prove the first theory, doubt has been deliberately cast upon the identification of the specimen caught in brackish water at Kingswear near Dartmouth, in 1933 without re-examining the specimen though it was responsibly recorded in a scientific journal. I understand the specimen's whereabouts aren't now known. Yet burbot inhabit brackish water in the upper Baltic. But this was not the only record from the Bristol Channel drainage area. The next modern records of *Lota lota* or *L. vulgaris* in the West of England were two specimens obtained in the February of 1938 at Oldbury-on-Severn, Gloucestershire, which measured 3½ and 4¼ inches long. Then a third, measuring 4½ inches long, was taken during March at Severn Beach. These were detailed by A. J. Lloyd, B.Sc., on p.221 of his "Marine Fish Fauna of the Southern Shores of the Bristol Channel" in *Proceedings of the Bristol Naturalists' Society*, Vol. IX, pt. II, 1940. They confirm the inclusion of the burbot under its old name "eele-pout" in J. Smyth's list of fish in the Hundred of Berkeley in 1639, in *The Berkeley MSS* published in Gloucester in 1885.

There are no burbot in Cheshire now, nor are any of its rivers suitable; but in earlier ecological conditions when fenland was more widespread over the Shropshire-Cheshire plain, the slow-flowing, winding River Weaver was ecologically suitable. The burbot was recorded from this tributary of the Mersey by Dr. Isaac Byerley in his 1853 *Fauna of Liverpool*, on the statement of Nicholas Cooke, a notably young Cheshire biologist and entomologist of the period, that it had been caught there. Whether it was taken by rod and line, or more likely by net, is not stated. The late Prof. Jas. Johnstone did not reject this old Weaver record when compiling the section on Cheshire fishes in Coward's 1912 *Fauna of Cheshire*. He merely stated he had been unable to procure a specimen, and thus doubted whether it then occurred. He, too, had worked only on marine fish. Subsequent historians of Cheshire freshwater fish have done comparatively little research into distribution and apart from recent work by others at Rostherne, there has been no liaison or co-ordination among the largest natural history societies in the area. Nor did all field-workers co-operate in the publications. We do not accept any subsequent fish-list to be reliably complete or unbiased.

There are also 17th century records from the Staffordshire Trent and from the fens of Cambridgeshire, Lincolnshire and Suffolk; but Norfolk always had most burbot. There is no support for a statement by an angling writer in a sporting weekly in April, 1965 that burbot "are by no means uncommon in south-west Wales." More evidence is also required for a statement in May 1963 in a leading angling monthly that "some burbot are still caught . . .

in the very lowest parts of the Hampshire Avon," for the writer admitted he had never seen them himself.

However, what I wish to convey is the existence of some evidence that when ecological conditions were different, this fish was not confined to rivers draining into the North Sea. Indeed, the presence of the sub-species *Lota lota maculosa* in Canadian lakes indicates a marine Atlantic rather than a freshwater, continental Rhine origin of this ling-like fish. How far in the past it was an anadromous sea-fish migrating up-rivers from the Atlantic like arctic char, salmon, sea-trout, eels and the sea-lamprey, to spawn, we do not know; but this seems more likely to be its origin than that it came with the carps, perch and pike from mainland Europe, when the North Sea was land. That inexperienced people may have confused the loach, or that records from western rivers are often too old to trace and re-examine the specimens or cross-examine the recorders, is not sufficient to disprove an earlier occupation of at least three waters that did not flow east to the North Sea, in order to round off a theory that the burbot belonged to the old Rhine watershed. A recent statement in a natural history monthly that "the burbot has never spread farther than East Anglia, and now may well be extinct in this country" is no longer supported by it. It is unlikely that pollution has caused the decline, for many rivers have contained, if not improved, this condition and the burbot's low-oxygen demand would leave it one of the last fish to suffer, along with eel and carp. That it is an Ice Age relic or a post-glacial colonist is another theory.

In the past, the burbot's distribution ranged north to Durham but it is much more restricted nowadays, ranging no further north than south Yorkshire or beyond the Hampshire Avon. It has been taken in modern times from the Yorkshire Derwent at Bubwith, New Idle, the River Drain, Doncaster (1930-38), the Derwent at Thorganby, Elvington, and Malton, all in Yorkshire. One of its chief haunts, the Little Ouse, occasionally has yielded specimens to rod and line since the last war, one of 12 oz. in 1964. Its nocturnal, predatory and scavenging habits and steadily declining numbers in the increasingly better-drained lowlands do not lead to so many captures as formerly by hook and worm, though it was formerly marketed for food in East Anglia, where coarse fish have always been more widely eaten than anywhere else in England.

Ling-like with its flattened, bearded head; eel-like in its slimy, writhing body, the burbot is the only European-American freshwater member of the cod family, having a variety in the North American lakes. From the way its young, when nearly hatched from its large, yellowish egg, has its head bent downwards like the larval ling, it is obviously more closely related to the ling than to the cod. A variety is the Canadian Great Lakes ling, *Lota lota maculosa*. Although specimens have attained a length of 3 ft. and a weight of 8 lb. here in East Anglia in the past, it reaches nothing like that size in modern England, a decline in size indicating inbreeding in restricted and increasingly isolated haunts which many fear is leading to its extinction. Continental imports have been suggested to resuscitate its prospects for the future. Our freshwater fishlife is alien enough to warrant this; but even continental burbot would dwindle if increased drainage, and rivers cleaned and cleared of vegetation to flow faster, are unsuitable.

Preventing fish diseases

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safe no matter how good your dealer may be, no matter how much confidence you have in him. It is better to be safe than sorry and a little caution can prove quite inexpensive.

Quarantine

A quarantine tank is the answer; nothing elaborate, just a small plastic tank 12 in. × 8 in. × 8 in. (cost approx. 16s.), a combined heater/thermostat (25s.) and a sponge type filter (3s. 6d.). Total cost of set-up 44/6. *(See Fig. 2).*

Keep this equipment ready for use when required and quarantine new arrivals for two weeks before introducing them to your aquariums. During this period any disease the fish may have should be spotted. During quarantine an antiseptic can be used as a further measure.

Insurance

When not in use this equipment is not just lying idle. The combined heater/stat. insures you in case of breakdown in your aquarium's heater or thermostat. On finding a fault you can fit it into the aquarium (without this-spare, what would you do if such faults occur at say 10.30 on a Saturday night?).

Hospital tank

The complete set-up can also be used as a hospital tank (its small size makes it easy to sterilise). Other uses: a "prison" tank for a bullying or troublesome fish, or a temp. breeding tank. *But be strict.* Let the set-up's No. 1 role be for quarantine, otherwise it will soon become just another tank.

Boil nets

It costs nothing more than a little time to boil an aquarium net before and after use. In the case of a fish-house this may well prevent a disease from spreading from tank to tank.

PRECAUTIONS WITH LIVE FOOD

Tubifex: Always make sure tubifex is really clean before feeding to your fish.

Daphnia: Screen daphnia before feeding; makes sure only daphnia is added to your aquarium and not any of the more sinister pond inhabitants.

Garden Worms: be careful where you dig for worms; do not take worms from a garden which has been heavily treated with chemical fertilisers.

Bluebottles: If you have Archer fish, Butterfly fish, etc., which require live bluebottles, always hatch your own from maggots; this way you are sure they are clean. It is possible that one caught flying around the house has just been sprayed with a heavy dose of D.D.T. by the lady next door.

I hope more experienced aquarists have not been too bored reading these lines, and that some of the information is helpful to newcomers to this very wonderful hobby.

The salt-water angelfishes

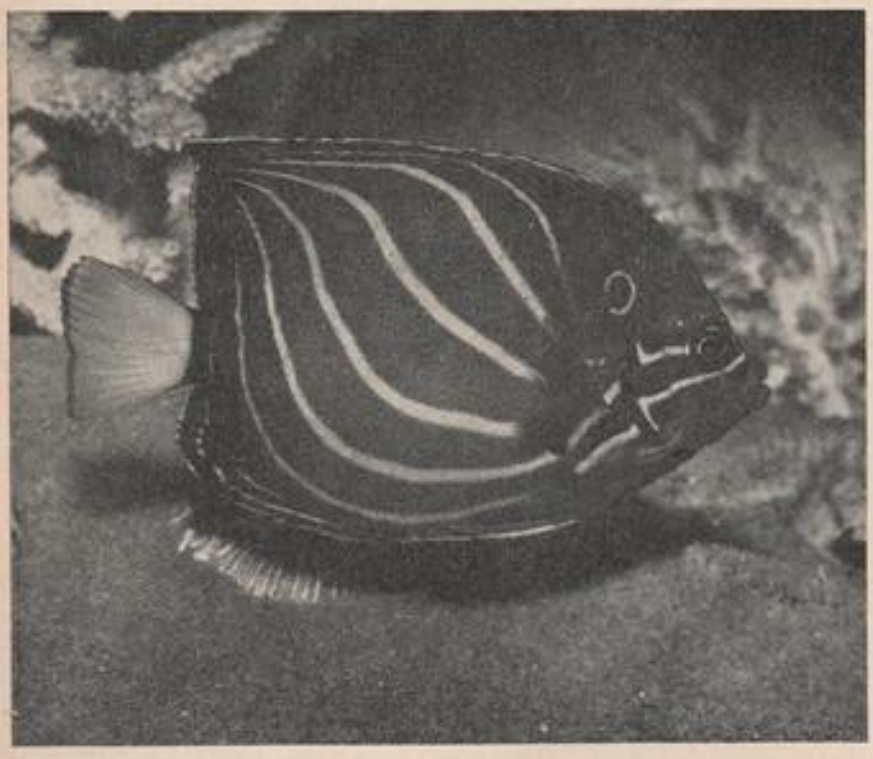
by **Trevor Wild**

THE angelfishes belong to the family Pomacanthridae and are split into the genera: *Pomacanthus* (which is by far the largest genus), *Angelichthys*, from which we derive the name angelfish (Angel-angel, ichthys-fish), and a few others which often only have one species per genus. These fish are common to both the tropical Atlantic and Indo-Pacific. *Angelichthys* and *Holocanthus* are restricted to the West Indies, whilst all others live in the area of the Pacific reefs. Some Pomacanthids, just to be awkward, inhabit both regions. However, one thing all marine angels have in common is a razor sharp spine at the base of the operculum. This is used as both an offensive and defensive weapon. Its function is to provide the owner with a means of protecting his spawning ground from would-be invaders, often of the same species. From this it is understood that these fish are territorial in their habits. Food is taken only in mid-water and for this reason nature has provided them with protruding jaws. Angelfish are rock grubbers; that is they nibble at the small crustacea and algal growths which cover the reefs.

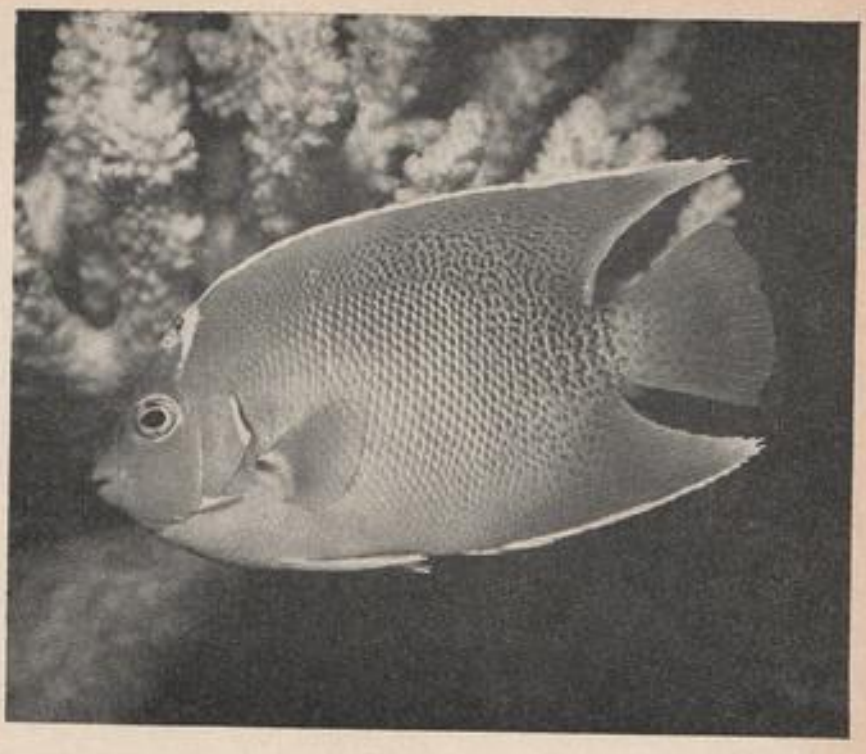
Closely related to the Chaetodons they, too, have remarkable patterns and colours. Some fish cannot be defined as either butterfly fish or angelfish. Take the case of the red *Chaetodonoplus*, which has the general body shape of the Chaetodons, but the method of feeding and the ray count (i.e., the number of rays on the fins) shows it is also closely related to the *Pomacanthus* ssp. One thing all Pomacanthids have in common, apart from the spine, is an abundance of dorsal finnage. In particular, the *Angelichthys* which can easily be distinguished from others by their long, flowing dorsal and ventral fins.

By now any normal aquarist will be wondering whether or not he can obtain and keep them in his own home. This is quite feasible as long as certain rules are adhered to stringently.

(1) Do not mix several of the same species. This can only lead to quarrels and possibly fatal fights. It is quite alright to have several fish, each a different species, in the same aquarium as these will not try to attack one another provided their patterns are different. Perhaps a freak *Angelichthys* looks just like a *Pomacanthus semicirculatus*



Pomacanthus annularis.



Angelicthys ciliaris.

impossible), then it may be badly savaged by [illegible] *P. semicirculatus.*

2. Give them plenty of room for growth as some can, and quite often do, reach the terrifying size of two feet. Coupled with (2) is:

3. Do not, under any circumstances, attempt to dwarf the fishes by keeping them in too small a tank. Just as you're putting yourself on the back for your astoundingly clever idea of putting your prize Rock Beauty in a small aquarium, due to the fact that he hardly moves, the stupid thing dies.

If you find you have on your hands, a twelve inch angelfish in a three-foot tank, give him to a zoo. They will be only too glad to accept him. At least its better than a watery grave, and anyway, you can go and visit him at week-ends.

4. Give them plenty of aeration and keep the water fresh and clear at all times.

5. No matter what, as I have said before don't be tempted into buying a pair; one will die anyway.

Now that we have learnt about the angelfish family we can study the individual species.

POMACANTHUS SPECIES

Pomacanthus annularis: Circled Angelfish.

This gorgeous fish comes to us from the Indo-Pacific and reefs. It can reach a maximum size of 15 inches but is more commonly seen at around the 3-inch mark. The basic colour of this fish is dark brown. On top of this drab background, brilliant blue, almost luminous, streaks and stripes. As the annularis matures, a blue circle appears over the eyes which makes it look as though it is wearing a halo several sizes too small for it.

One word of warning, the *annularis* will often refuse food when first he arrives. To break his self-imposed fast a number of adult brine shrimp should be put in with the fish in a quarantine tank and you will find he will devour them with relish. This is usually enough to get him feeding properly. However, if it is possible, buy those which have plenty of flesh around the abdomen, so they will not suffer greatly if they do attempt to starve.

Pomacanthus imperator: Royal Angelfish.

The royal angelfish is only mentioned because of its fantastic colour-change. The juvenile form is black with a multitude of cream stripes emanating from the tail region. As the fish matures the body-change takes place; the head becomes larger in comparison with the body. Black gives way to blue overlaid with yellow bands and the cheeks turn white. It is rarely on display in the aquarium supply shop where it would fetch in the region of £25 for a 3-in. specimen.

Pomacanthus semicirculatus: Koran fish.

If you wish to keep an angelfish then this is the one I would recommend. It is very tough as well as incredibly

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beautiful. A three-inch specimen will retail at £4 or £5.

When young it looks very much like the *P. imperator*. However, it turns brown with many bright blue stripes as it gets older and then is not quite as pretty.

ANGELICHTHYS SPECIES

Angelichthys isabelita: Blue Angelfish.

The blue angel is one of those angels which hail from the West Indies and is very popular in the United States, where it is quite cheap as marines go.

It is basically yellow in coloration and the name blue is certainly a misnomer. It is a graceful swimmer but rather faddy about dry foods.

Angelichthys ciliaris: Queen Angelfish.

This is a really beautiful fish and has been given the title, queen, because of the blue crown-like mark on the forehead. It can reach two feet in length and is absolutely incredible with blue face and long blue edged fins.

Angelichthys townsendi: Townsends Angelfish.

Sandy with a few blue marks on the face this is not particularly colourful. It is also rather rare and very expensive indeed.

HOLOCANTHUS SPECIES

Holocanthus tricolour: Rock Beauty.

The spectacular colours of the rock beauty make it a very expensive and popular fish. For some reason, however, it is not often seen. The body is yellow with a large dark blue, almost black patch near the tail of the fish. It is a good community fish but a size of two feet is enough to put most people off buying an adult.

CHAETODONOPLUS SPECIES

Chaetodonoplus mesoleucus: Red tailed *Chaetodonoplus*.

This is a very nice fish for a community tank as it is a hardy angel. It is not strictly an angel but a butterfly, but it does grow rather large for a butterfly.

The tail, of course, is red and the body is blue near the tail becoming paler towards the head until the head is white.

PYGOPLITES SPECIES

Pygoplites diacanthus: Regal Angelfish.

Without exaggeration this is the most beautiful creature in the world. It has never been seen in a British aquarium. A Pacific fish, it reaches 7 inches in the wild, and is coloured thus: the body is vermilion or orange, depending on the area in which it lives, white bands edged with blue and black cover most of the vermilion. Fins are red and blue with the exception of the dorsal and anal fins which are pink and violet, and purple respectively.

The regal angelfish is rather delicate and, for that reason, very expensive.

Of course, there are many others, but they are too nervous and expensive for the amateur aquarist.

FEEDING

This does present a problem as they will only take live foods. The new freeze-dried foods seem to be taken by most species and so no smelly cultures of tubifex or daphnia are needed.

From far and wide

by T. G. Wall

RECENT research by Mr. Red Nicholls of the Jungle Laboratories in Duluth, Minn. U.S.A., has shown that the practice of acclimatising new fish by "floating" them in polythene bags is wrong, in fact often fatal. Quote ". . . the polythene bag is a maze of water-repellent fibres too small to be seen with the best optical microscope. Bags exposed to the air will 'leak' gases very rapidly, the fibres being open and porous to oxygen and carbon dioxide gas molecules, whilst floated bags will not, as the pores are closed by the outside liquid. Very little oxygen is available in even the best water, say 10 parts per million, whilst air has approximately 200,000 parts per million! This vast difference accounts for the rapid oxygen starvation of floated fish. Brain damage occurs in most fish when the carbon dioxide content rises much above tolerance level, and lingering death or incurable disease is their lot from the physical damage that is non-reversible"—unquote.

Mr. Nicholls advocates instead, that, where the temperature of the "bag" is lower than that of the intended home, new fish should be just "dumped into the water". He says ". . . tropicals may be introduced into *warmer* water at any time without ill effect of any kind. *A twenty degree* increase will not damage them providing the higher temperature is within the range normal for the fish."

For those aquarists of a nervous nature who will be reluctant to try this "instant immersion" with treasured new acquisitions, there is always the "show-jar method" —either open the bag and place it in a *dry* jar or simply transfer the fish to the jar for their floating time.

There is further evidence this month that the keeping of tropical fish is becoming more and more widespread. At least one of the giant "mail-order houses" include several items of equipment necessary to the hobby in their recently issued catalogue. These include a stainless steel glazed aquarium (one size only, 24 inches), a ditto hood (rather expensive), a combined heater and thermostat, and a well-known power filter. Furthermore, a waterproof watch is shown elsewhere in the issue apparently immersed with a pair of red swordtails! The inference to be drawn is obvious, these people are not in the business for fun, it must mean that the market is growing.

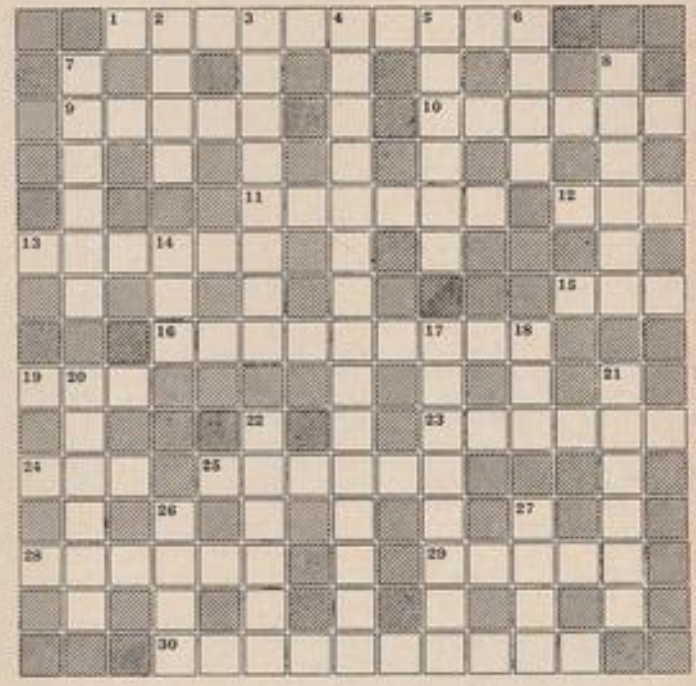
A Soviet scientist recently reported that cod and haddock sleeping at 2,000 feet took no notice of his diving chamber or even its powerful blinking lights—"we could not wake them up" he said. An associate curator of the U.S. Natural History Museum, New York, had the same trouble with trigger fish in the marine laboratory in the Bahamas. She said they were "deaf to the world", and only repeated banging on their tanks woke them up.

Garbage disposal problems? . . . try *Hypophthalmia molitrix*. The Japanese (devilish cunning) have found that *Hypophthalmia molitrix* thrives in plankton which grows on domestic sewage. Now 200,000 fish are being raised in ponds to help cleanse rivers polluted by factory waste.

The "Aquarist" Crossword

No. 2

By G. W. DOWNES



CLUES ACROSS

1. Species of Cichlid (10).
9. Ticket (5).
10. Does this plant provide food for aquarist's fishes ? (6).
11. Make happy (6).
12. The target of the archer maybe (3).
13. May 22-June 21, or part of a space project (6).
15. Employ (3).
16. There are no restrictions after this (4, 5).
19. Morse maybe, without a note to form this fish (3).
23. Family of fishes to which 17 down belongs (6).
24. You do it with your little eye (3).
25. An invader of China (6).
26. Cichlasoma Severum is sometimes called this (6).
29. Comes closer (5).
30. This sounds like a wonderful place for fish (5, 5).

CLUES DOWN

2. This barb is a real gem (4).
3. They're from the cichlid family (6).
4. The common name for 1 across (3, 5, 7).
5. Stamp (6).
6. He probably ate Carp (4).
7. Your aquarium probably is (6)
8. Angels maybe, but they could be obtuse (6).
14. Seedy (3).
17. Go mad around the vessel for this fish (6).
18. Vessel (3).
20. It could be called a fish fancier (5).
21. Hate the sound of two rivers ? (6).
22. Girl (6).
26. A dance with nothing off produces something for the marine enthusiast (4).
27. A Genus of frog (4).

SOLUTION
on page 439

Our experts' answers to your queries

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of the fancy being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent so that a direct reply can be given.

COLDWATER queries answered by A. Boarder

How can I breed common garden snails for eating?

Garden snails, *Helix aspersa*, are hermaphrodite and so capable of fertilising the eggs of another snail and yet able to lay eggs fertilised by the other. They are vegetarian in feeding habits and would have to be fed on rather soft vegetation such as lettuce leaves and young brassicas. They move about and feed mostly at night except sometimes after rain. They spend most of the day-time in damp shady places and hibernate during the winter unless kept warm. They are smaller than the edible snail, *Helix pomatia*, which is eaten in France. It would take you a long time to breed enough snails to make a good feed. *Vive la France!*

Edible snail (*Helix pomatia*).

I have a tank 48 x 15 x 15 in. and have eight 2-in. shubunkins and two 4-in. nymphs. The water temperature is 68-69°F. The water is continually being clouded with Algae. The tank stands near a window. What is the cause of the water clouding up?

The clouding of the water can be caused by two or three reasons. First is over-feeding especially with dried foods. Secondly, if the water turns green it is because too much light gets to the tank and thirdly the temperature of the water. If you stop all dried foods for a week you might see an improvement in the water. Cut down the light reaching the tank by placing dark paper on the end towards the window. Do not use your overhead lighting for so long each day and see if the green disappears. The temperature of the water is too high for keeping coldwater fishes and this could encourage clouding. Room temperature is quite sufficient for the type of fishes you have and if they had been kept at the higher temperature when you bought them this should be lowered gradually to ordinary room warmth. Higher temperatures could be used to raise fry but once they are of the size of your fishes this could be lowered.

I wish to increase my stock of fish in a garden pond. Would April be time enough to introduce them and shall I feed them on arrival?

The time for introducing new fish into a garden pond depends not so much on the time of the year as the temperature of the water from whence the fish came. If they had been fairly recently imported it is probable that they had been kept in rather warm water and if such fish were placed directly into a cold outdoor pond they could suffer from it. Find out when you buy in what temperature they have been and then you will have to gradually let the water in the carrying receptacle get near to that of the pond. It can be dangerous to put fish straight into a cold pond if they have been in warmer water. There is no need to feed the fish as soon as they arrive. Let them settle down for a few days, they will not die of hunger if left for some time.

I have a fibre glass pool in my garden with a few goldfish. I have not fed them during the winter but as they are now swimming around, shall I start to feed them?

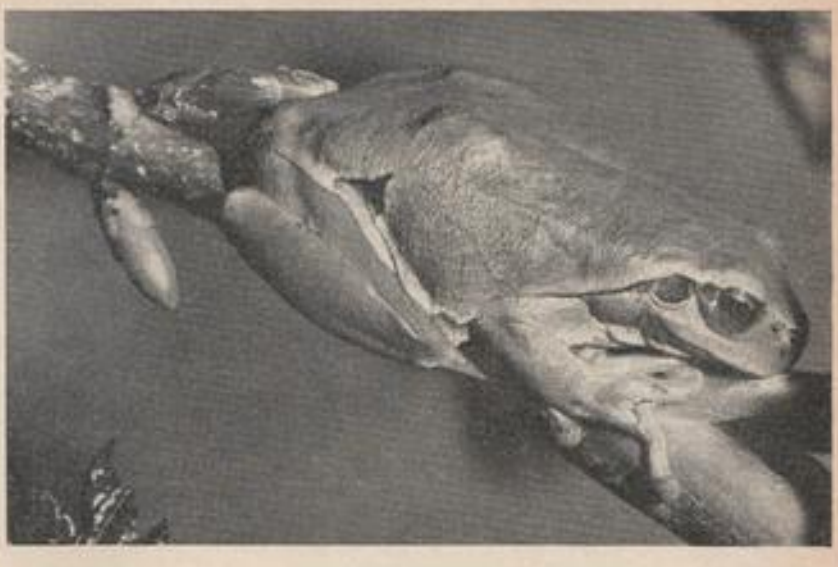
If the fish are very active they can be fed. Just offer a little food at a time and see if it is cleared up. If so a little more can be given but do not overdo it. Some broken garden worms are one of the finest first foods.

I have two comet goldfish in a tank and they seem to suffer from ragged tails and fins. There is also some fin congestion. I have one catfish in the tank. What is the reason for the fin damage?

The catfish must be suspect. These fish, that is the coldwater ones, *Siluris glanis*, are carnivorous and with such a huge mouth they can eat small fish and if they are not able to do this they certainly are fin nippers. Get rid of the catfish and you may soon find an improvement in the condition of the goldfish.

I have lost some goldfish in my pond. The first sign is that the fish floats on the surface and when it dies shows no signs of damage or fungus.

Usually when fish die in a pond as you describe it is due to foul water. Clean out the pond and conditions should improve. Most small garden ponds should be cleaned out every late autumn when most of the leaves have fallen and the vegetation in the pond has died down. Such pond water can become very foul in a matter of months and fishes will then die.



European tree frog.

Two frogs have appeared in my pond. Do I throw them out or can they remain?

The frogs come to the water to spawn and once they have done so they usually leave the water. At times one or two will remain in or around the pond for the summer. They do not eat under water and so are not likely to harm the fish. However, it is possible for an unattached male frog to clasp a goldfish and kill it. Once a male frog gets contact with another frog or fish there is a reaction of the front legs and they take a firm grip of whatever they have captured. A goldfish can be killed by the pressure. During the past thirty-one years I have had dozens of frogs in my pond each year together with a number of fantail goldfish. During that time I have lost two fish which I put down to frogs, and so the risk is small. If you do decide to remove the frogs you will have to take them some distance away or they will find their way back to your pond. Their tadpoles can be eaten by goldfish but if they are not eaten when about half-grown it is possible for them to become very fast swimmers and so escape the fish. There is also a risk of the tadpoles eating the mucus from a fish, especially one which is rather sluggish or unwell.

Some of the goldfish in my pond were found dying and others swimming slowly on their sides or just lying on the surface. They showed no signs of injury or disease, what was the cause ?

It is almost certain that the water had become very foul and was lacking in oxygen. It could also be said that the water was over-charged with foul gases. When fish are seen in such trouble the water should be changed as soon as possible, even playing fresh water from a hose will revive the fish and they can be swimming normally in a few moments.

I am going to buy two Tree frogs and cannot find any information on their feeding habits. Can you help please ?

Tree frogs will only eat live foods small enough for them to take. They can be fed on flies especially fruit flies. Anything moving such as small maggots or white worms would be eaten but you may find that the difficulty in keeping the frogs healthy will be in obtaining sufficient small live foods for them.

Male frogs possess a very strong clasp in spring, as shown here where both sexes are shown in amplexus.

tropical fish-keeping queries answered

I should be grateful for some information on the preferred food, disposition and temperature requirements of *Tilapia macrocephala*?

T. macrocephala is not faddy about what it is given to eat, but it is essential to include plenty of greens (water plants and cooked vegetables such as spinach, soft cabbage and/or brussels sprouts) in its diet. Large specimens are bullying by nature, and the males can be really spiteful towards females of their own kind. A temperature range of about 72°F (22°C) to 78°F (26°C) is quite suitable.

Tilapia macrocephala

How does one sex *Hyphessobrycon serpae*?

In well-grown fish the fins of the male are better developed than those of the female. Also, his colours, especially the reds, are more intense.

An aquarist friend has some prettily coloured fish which he calls herring-bones. He cannot tell me the scientific name of these fish. Can you?

Rivulus strigatus is sometimes called the herring-bone (rivulus) on account of the several red V-shaped markings (the angles facing the head) which adorn the blue sides.

I have been advised to introduce some *Limnaea* snails into my thickly planted tropical aquarium to get rid of what looks like becoming a plague of hydras. Do you think I should act on this advice?

Limnaea snails (and blue gouramis) would help to keep hydras under control, but the most certain way of ridding a tank of the little pests is to add one teaspoonful of household ammonia to every gallon of water in the tank (after the fishes have been removed). After two hours, change the water for fresh.

I have made an aquarium frame from aluminium strip. If I paint the aluminium with two coats of enamel paint before glazing will this protect the fish against metal poisoning?

The toxicity of aluminium to freshwater fishes is low and two or three coats of some good enamel paint on the frame before glazing should prove perfectly satisfactory.

Is it a fact that goldfish have been cross-bred with tropical barbs?

Reports of such crosses have appeared in aquarium magazines at very infrequent intervals over the past 35 years. Hervey and Hems, in *The Goldfish*, tell of a German aquarist who succeeded in hand-spawning a "Veiltail Goldfish × Rosy Barb (*Barbus conchonius*). The progeny were perfect barbs with the drooping tail of the Veiltail." The authors add, by way of a footnote, that this spawning was recorded in *Bird Fancy and Aquaria News*, of the date February 23rd, 1935.

Is *Barbus filamentosus* suitable for a community tank?

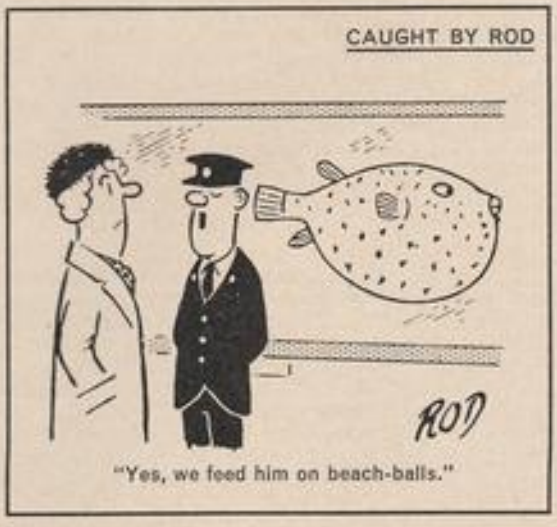
This species is not to be recommended for a community aquarium, that is an ornamental aquarium; it dashes about far too boisterously, may reach a length in excess of 5 in., and includes lots of greenfood (aquarium plants) in its diet.

Has the red-eyed puffer fish (*Tetraodon somphongsi*) been bred in the freshwater aquarium?

The red-eyed puffer has mated quite a few times in captivity, but so far as we are aware none of the spawnings have proved successful. The difficulty appears to be in finding a food to suit the tiny globular fry.

The books I have describe the yellow rasbora (*Rasbora elegans*) as peaceful, yet my pair squabble quite a lot and I would not like to trust them in a tank stocked with diminutive fishes. I should appreciate your views.

The yellow rasbora is a lively species and a pair will indulge in the usual chasing and sparring about common to wide-awake and strong swimmers. It is not unknown for a sexually frustrated female, or a large female, to bully her male companion. As for the inclusion of this fish in a community tank, please bear in mind that few fishes of the length of a fully grown *R. elegans* (up to 5 in.) respect the feelings or needs of fishes less than half their size.



"Yes, we feed him on beach-balls."

15,000 fish make it a busy life

Above: Angel fish, breeding size, marking one of Jack Goodman's early triumphs after months of experiment.

Below: One of the early distinctions won by Chiswick Aquaria; the Award of Merit at the National Exhibition at Olympia in 1955.

• *A visit to Mr. Jack Goodman's Chiswick Aquaria*

IN the beginning it was just a hobby, keeping a few fish at home as a relaxation. Pretty soon the hobby took a firm hold; the initial tank was multiplied to a total of 34, they spread out of the house and into the garage, banishing the family car to the garden and keeping the enthusiastic hobbyist totally committed in his spare time. At this stage, Mr. Jack Goodman almost lived in his garage-aquarium, and his wife was known as the "Fish Widow".

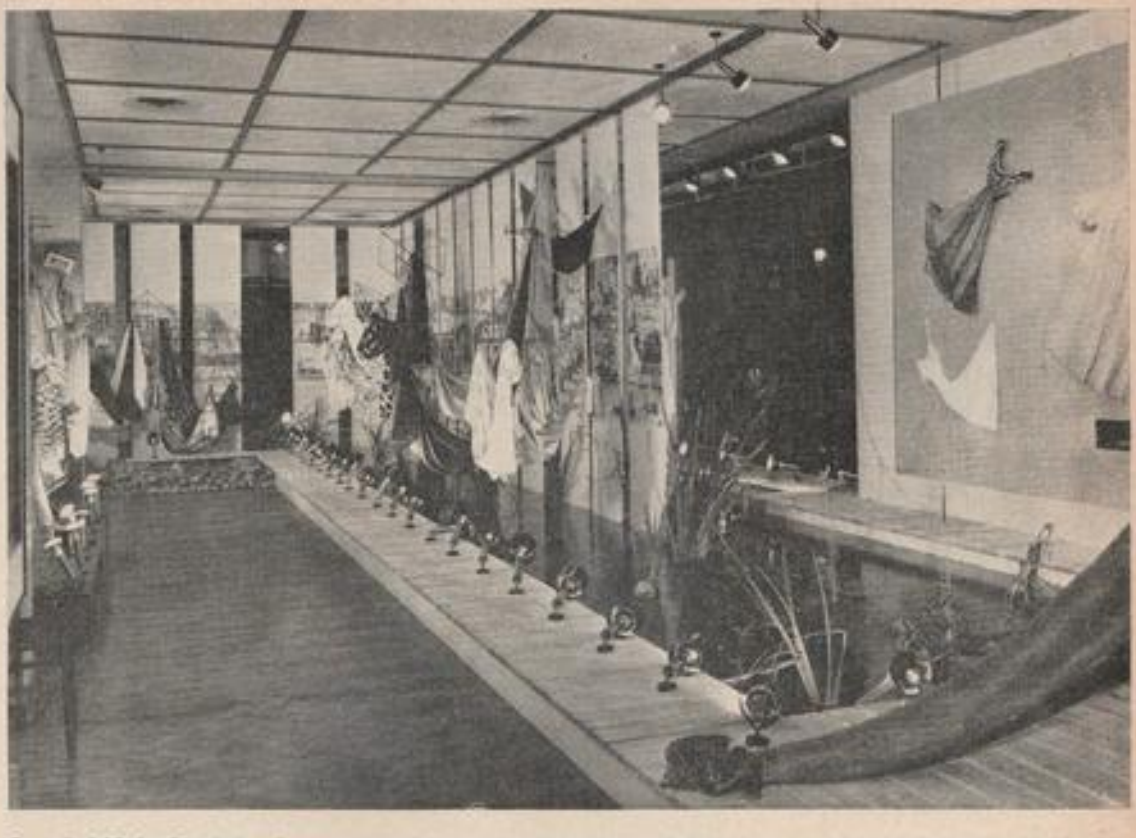
That was before Jack Goodman had any idea of becoming a professional aquarist. He began his business life as a manufacturing chemist, and at one time had a staff of 44. The changes resulting from National Health legislation had an unfavourable effect on the type of business namely the manufacturing of pharmaceutical chemicals, materials, etc., and Mr. Goodman "saw the red light", as he puts it, and moved into the world of aquaria on a professional basis.

His experience as a chemist was a distinct asset in his new activity. Applied to fish diseases and tank analysis it was invaluable in finding the solution to problems and avoiding errors that could have proved costly. It is knowledge that has gone a long way in building the reputation he has earned since 1950 for his well-known business in Chiswick High Road.

That reputation has, however, been acquired by more than "know-how"; it has resulted from a determination amounting almost to dedication to deliver what is wanted, when it is wanted, and in first-class condition. Jack Goodman's day starts not later than 5 a.m. to be sure of getting deliveries of fish away on the early trains. The reward is apparent in his guarantee of live delivery, and his standing as one of the biggest importers in Great Britain.

In the 198 tanks at Jack Goodman's Chiswick Aquaria there are rarely less than 15,000 fish, and a walk round the collection conjures up exotic visions of faraway places. From Thailand there is the Red-tail Black Shark; from India, the Glass Fish; from Africa, Jewel Fish. The quaint Trigger fish with its brilliant blue stripe along its jet-black body comes from the Aleutians, and South American rain-forests and jungles are brought to mind by the Head Standers, the Silver Hatchets, the Dwarf Cichlids, and many more.

One of the first to bring marine tropicals to this country, Jack Goodman achieved the distinction only after considerable care and experimentation. Others had tried and failed, and it was again his experience in chemistry that led the persevering owner of Chiswick Aquaria to success after six months of painstaking research. The main problem was one of water content, and the Goodman



formula laid the foundation for the successful results that have followed.

His interest in breeding goes back a long way; he believes he is one of the pioneers among professional breeders. His greatest thrill was to breed Angel-fish for the first time, and to his knowledge he was the second person to do this in England; beginning hopefully with successive attempts that ended in failure; then seeing a dozen come to free swimming before perishing to leave one lone survivor; and ultimately nursing his experiments to gratifying success with spawning of two to three hundred.

Where did he go wrong in the early stages? His answer was simple and positive: "Too much fiddling about with the water". He learned that over-experimentation with water and too-frequent changes not only put the fish off spawning but killed them, and with that discovery the major obstacle was overcome.

On the subject of unusual fish I asked Mr. Goodman if he had any favourites and learned that he is still following a long trail in search of a Clown Trigger. This aquatic comedian is a rarity, but negotiations are in progress for a possible source of supply from the Caribbean. Otherwise, the Goodman collection has covered almost every kind of tank specimen.

In his eighteen years as a professional aquarist, Jack Goodman has seen many changes. Tanks have come a long way since he wrestled with his own designs in the middle "thirties", and the £ s. d. of aquarium keeping has been trimmed down impressively. In those early days a neon cost two guineas, harlequins and angels were 17s. 6d. each and not a mere half-crown as now; and Golden Barbs, which today sell at around 3s., were 35s. each.

It was interesting to learn that some 90 per cent. of the B.B.C.'s requirements for live stock, including fish, on television is drawn from the stocks at Chiswick Aquaria. But fish are not the only stars in the establishment; there is Pancho, the venerable monkey whose T.V. appearances are countless; Percy the parrot appeared in "The Beachcombers" with Hattie Jaques; recently the hamster at Chiswick Aquaria figured in episodes of "Z-Cars", and there are other starlets among the birds and sundry fauna that figure in the attractions of this unusual shop on the High Road.

A final question to the energetic owner of Chiswick Aquaria—"What plans for the future?"—brought a prompt and emphatic answer: "To retire!" It's a round-the-clock activity, often with the phone ringing in the small hours with a query on imports. Jack Goodman will be quite happy to quit and take up a hobby—such as keeping fish, perhaps?

W.J.Y.

Above: Part of an elaborate pool 96' long provided by Mr. Goodman for an exhibition—another of the many activities of his Chiswick business.

A dozen years of BASS

The British Aquarist Study Society

•

Photo above: the original officers of BASS in 1956. From left to right: A. Cooper, R. G. Mealand, Russell Holland, (committee), J. Gilbert, J. E. Edwards (secretary-organiser), John Judge (treasurer), Dr. Pearlman (chairman).

•

THE British Aquarist Study Society (BASS) must be one of the most unique aquatic societies in the world. It is a Society that has only three set meetings a year, holds no fish shows and all its members are experienced aquarists who come from all parts of the British Isles.

The Society, which was formed in August, 1955, originated in the South of England where the Organiser and Secretary, Mr. J. E. Edwards, contacted many well-known aquarists. These people thought that a Club formed with the betterment of the fish hobby as its main object and an emphasis on research was bound to succeed. Because of the wide distribution of its members, BASS was run largely by correspondence and a regular news letter of Club activities.

On 4th November, 1956, the first A.G.M. was held and Dr. Pearlman was elected Chairman, Mr. J. E. Edwards—Secretary and Mr. J. L. M. Judge—Treasurer. By now the Society was 60 strong and various activities were taking place. "At-Homes" were held by several people, whereby members could sit and have a general fishy natter with other members. The now formed Technical Committee has organised several serious fishkeeping experiments in which all the members have been able to participate. These experiments form one of the most interesting and important aspects of the whole Society and many interesting results have been obtained.

In 1957 it was decided to hold an annual Conference and on 26th October, 1957, the first such meeting was held at the Zoological Society's Headquarters in the London Zoo. Mr. R. G. Mealand was elected the first President of BASS and Mr. Mandeville showed a series of films and Dr. Ghadially answered any technical questions.

This meeting proved so popular that three conferences were then organised each following year.

At all conferences two of the leading speakers in the country give lectures on all aspects of fishkeeping and any other allied subjects. The majority of meetings so far have been held at the London Zoo, but there has been an excellent meeting at Belle Vue Zoo and further meetings in other areas of the country are hoped to be arranged some time in the future.

As was mentioned earlier—one of the most important aspects of BASS is its Research Committee which organises

Continued on page 437

FIRST STEPS IN FISH-KEEPING

● *Colour supplement to "The Aquarist and Pondkeeper", June 1968*

Plan for COLOUR in the Garden Pond

by A. Boarder

■

Water Lily: Rose Arey. Suited to depths of 1 to 2 feet. A strongly scented variety

Also in this supplement:

- **Starting with Goldfish**
- **Success with a Tropical Aquarium**

THE garden pond can be one of the most colourful aspects of the garden and not only the pond itself but its surroundings may present a beautiful picture. There is no doubt that the informal pond will be easier to make very colourful but it is not impossible to brighten up the formal one. The latter with perhaps a stone path all round it may present a problem, and it is often by means of formal flower beds near the pond that a lot of colour can be provided. Where a flagged walk surrounds the pond it may be possible to insert small plants between the cracks of the path, but these should only be the dwarf kinds such as the smaller Saxafrages or Sempervivums.

Obviously, plants which will grow tall or make strong tufts cannot be used as they could interfere with walking or become too large and spoil the view. Short growing rock plants such as some of the Thymes would be ideal

Pickerel weed
(Pontederia cordata)

and even if trodden on they would not be killed by it and could give off a fragrant perfume.

However, it is the informal pond which lends itself best for beautifying and if any type of rockery had been incorporated with it when constructed, this would add the special feature which could be converted into a really handsome part of the garden. When a pond is being constructed, by whatever method, it is certain that there will be plenty of spare earth from the hole. This can be piled up to one side to make the basis for a rockery. At the same time it may be possible to construct a bog garden at the base or to one side. No pond should ever be constructed so that it is not easy to get to it for maintenance. At least a third of the edge must be within reach and this will also improve the view of the pond. If the rockery takes up about a third of one side it can run down to ground level at one side.

The rockery is usually one of the most attractive features near the pond especially during the first two or three years after construction; but after that it often becomes so over-grown as to lose all its beauty.

For a small rockery I do not think that there is any need to go to the expense of buying large Westmorland rockery stones. After all, in a couple of years most of the stones will have become covered with plants. It is only when very large rockeries are being made, like those in Kew Gardens, that large stones are essential.

There are many rockery plants available and it would not be possible to name more than a few. Most of the usual rockery plants flower in the spring but it is possible to find plenty which do so later in the year. The great favourite for the early part of the year is the Aubretia, which can be had in many shades of mauve, purple and pink. If it is cut almost back to the roots after flowering it can be kept in control better and will give a finer display the following year.

The Cistus (Rock rose), is a splendid plant which makes a small bush with many flowers in several soft shades. Some of the dwarf Dianthus and Phloxes are ideal for the rockery and a look through the specimens offered at nurseries will provide many more suitable plants.

It is when the lower part is reached that the water gardener can go to town. If one part remains very damp for most of the time it is possible to grow many very handsome flowering types and the one which is never forgotten if seen growing well is the Primula. There are several types for the bog garden and the *Primula japonica* and *P. denticulata* (the drumhead primula) will provide plenty of colour for weeks. The former are particularly handsome and lend themselves well for the pond-side. Their reflections in the water give a double beauty. The *P. denticulata* can now be had in mauve, purple, pink and even white. They carry large tight balls of flowers and often come up from seed some distance from the original plant. In a suitable position they will increase each year and can be divided without trouble when flowering has finished.

Another fine plant for the bog garden or pond-side which does not grow too tall is the Mimulus or Musk. Some of the newer hybrids are very colourful, having large yellow flowers with large chocolate or red markings. A wet position suits these plants best. A plant for the larger area is the Astilbes which makes a compact clump and sends up feathery spikes in soft shades of pink. One

". . . One of the most colourful aspects of the garden"

Above:
On the higher levels of this colourful pond surround are red saxifrage and aubretias. Below the rocky step and in the muddier region of the pond's edge are drumhead primulas, fritillaries and double marsh marigolds. Floating leaves and white flowers of the water hawthorn *(Aponogeton distachyan)* pattern the water surface

Left:
Candelabra primulas provide the foreground display in this large informal pond

must not forget the often neglected Forget-me-not (*Myosotis*), which can now be obtained in striking blue colours and with large flowers. These look best when planted in a small clump, fairly close together. If left to seed they will come up again every year but the larger types soon revert back to the wild kinds.

For a rather damp but not too wet spot the Polyanthus will make a brave show in the spring. The variety known as Pacific giant are particularly fine, having large flowers in many shades, some a rich blue. Although these plants may be left bedded out all the year round I find that they give the best results in either their first or second year. They are easily raised from seed. The coloured primroses are very dwarf and make a fine show but I have never found them particularly cheap to buy nor easy to raise from seed; at least in quantity.

For colour in the pond itself there is nothing in my opinion to beat the water lilies. Once a lily is introduced into a pond it should flower every year without fail and the only trouble may be that after a few years it must be pruned quite heavily or it will take over most of the pond, especially if the pond is a small one. Water lilies may be purchased for the small shallow pond as well as for the deeper one. No lily will require more than two and a half feet of water above the crown of the plant and some of the miniature types can grow in nine inches of water. The choice of colours must be an individual one and once one's mind is made up it is better to leave the selection to the dealer. Tell him the colours you prefer and the size of the pond with the depth of water. He can then recommend the ones with which you are more likely to succeed. There is little worse than trying to grow a large type of lily in a small pond. After a time the lily leaves will cover the surface of the pond hiding all the occupants. Some of the leaves will then grow up into the air and no water will be seen nor sign of a pond. This may sound an exaggeration but it is quite possible for this to happen; remember that the lilies will never be short of water even during a heat wave.

Apart from the lilies there are several other fine water subjects which can give colour and a fine strong growing blue-flowered one is the *Pontederia cordata*, or Pickerel weed. This has pointed heart-shaped leaves and flowers with a blue spike. Like the lilies, these plants must be kept strictly under control or after a few years they can choke out some of the more delicate plants. The Water *Ranunculus* types are good for the edge of a pond as well as the bog garden and it will be found that many of the bog plants will also grow well in the water at the edge of the pond. Either small shelves can be provided for such plants or they can be raised with bricks. For a fairly large pond one of the finest water plants is the water crowfoot, *Ranunculus aquatilis*. This has fine under-water leaves but a roundish shiny leaf on top of the water. In spring the whole surface above the plant can be covered with white, buttercup-shaped flowers.

Near the sides of the pond it is possible to plant some of the reeds and rushes, some of which have quite an attractive flower head. *Butomus umbelatus* is a good one but needs plenty of space. With all the many plants from which to choose there is little danger of not being able to find sufficient plants for the pond or its surrounds, the trouble will come later if one has been too liberal with the plantings.

Water Crowfoot (*Ranunculus aquatilis*)

STARTING WITH GOLDFISH

by
A. BOARDER

A pair of common goldfish in a simply furnished aquarium

TO be successful at keeping Goldfish it is essential that a correct beginning is made. So often one hears of someone who has been disappointed and given up the hobby when a little care and knowledge at the start could have made all the difference. It is unfortunate that many people obtain a goldfish or two and knowing no better attempt to keep the fish in a goldfish bowl. These bowls are quite unsuitable and should never be used for housing goldfish. It is far better to get a proper aquarium or tank as they are called. A very good size is 24 in. × 12 in. × 12 in., but it is possible to keep a couple of small fish in one 18 in. × 10 in. × 10 in. The larger tank will be easier to maintain in a healthy condition and the smaller the tank the more difficult will it be to keep fish in a good condition.

Having procured the tank it should be washed out and then some gravel or aquarium compost placed in the bottom. Use enough to cover the base up to the top of the front frame (base) and up to two inches high at the back. A couple of small pieces of rock can now be added. This should not have any sharp edges and the type sold for rockeries, Westmorland stone, is ideal. It should be well washed before use. Some water plants can now be added and it will be found that they can be planted more easily if the tank is half filled with water. Two very good ones are: Hornwort, *Ceratophyllum demersum*, and *Elodea crispa*, now known as *Lagarosiphon major*. There is no need to use too many kinds of water plant as the two named will soon grow and be adequate.

If the plants have roots these can be pushed into the gravel carefully or anchored by the rocks. Be careful if shoots are used to make sure that when weighting with lead strips, the tender stems are not broken. Try to keep the front half of the tank clear so that the fishes can be seen and have some swimming space uninterrupted by plants. It is well to allow the plants to get established and starting to grow before any fish are added. A couple of 40 watt electric lamp bulbs can be housed in a hood covering the tank. If kept on occasionally during the daytime they will not only make the tank look more attractive but will encourage the plants to grow and give off oxygen.

The tank should not be placed in front of a window or too much light might reach the water and encourage the formation of Algae which turns the water green. The back of the tank can be covered with dark paper so that it is impossible to see right through the tank. Once the plants appear to be growing it is time to obtain the fish. I recommend Goldfish for the start as they are usually the cheapest to buy, are very attractive to look at and are easier to keep than most other kinds of fish. Do not over-stock but have less fish than would be the normal. Each inch of fish requires 24 square inches of surface area. Do not reckon the tail when making assessment. The old idea of a gallon of water to each inch of fish is all right providing the tank is of the right shape. For instance a tank 12 in. × 12 in. × 12 in., i.e., a cubic foot, holds about six gallons of water. It can hold six inches of fish. If a tank held the same amount of water but was 24 in. deep with a smaller surface it would hold three inches of fish only whilst if the same water was in a tank six inches deep with the larger surface it could hold 12 inches of fish.

It is far better to get three fish of about three inches in length so that they can have plenty of swimming space. There is nothing clever in trying to keep too many fish in a tank. Trouble is sure to follow if you do. When picking out the fish make sure that they are healthy and

one of the best guides is to note if the fins are kept extended. Folded fins are one of the certain signs of ill health. See that the fish are bright of eye and active. Do not choose one which is mouthing at the top of the water, although this may not indicate that the fish is unhealthy but that the tank is over-crowded and the water lacks sufficient oxygen for the fish. When purchasing the fish try to find out the temperature of the water in which the fish have been kept and on what food they have been fed. Before introducing the fish to the tank see that the temperature of the water is not more than a few degrees different to that of the carrying container. This can be floated in the tank so that temperatures can become nearly equal before releasing the fish.

The next important step is the feeding. Do not think that the fish must be fed immediately it is put into the tank but give it a chance to settle down for at least a day. When feeding do not give a lot of food at a time. Goldfish have no large stomach in which to store a quantity of food and so must eat a little at a time. If there are some growing water plants in the tank it is certain that the fish will browse on these as they eat vegetable foods as well as meaty ones. A feeding ring is a good addition as it enables one to feed in the same spot and will prevent the food from spreading all over the top of the water when it is given. There are plenty of good fish foods on the market and it will be a good idea to try out a few to see which one type is preferred. Some fish will eat certain foods with gusto but ignore others and once a food is found which is readily taken it can be used most of the time. Besides dried foods from packets it is possible to give small broken garden worms and other forms of live food. There are few things edible which a goldfish will ignore if it is hungry.

Try to give various live and dried foods between feeds with the usual packet food, but remember that only enough should be given which can be cleared up in five minutes. The surest way to foul up a tank is to over-feed. More troubles are encountered by this than by any other means.

It should not be necessary to change all the water in the tank as if it is properly attended to it can run for years with just a weekly servicing. I had two tanks in a living room which lasted for seventeen years without ever being emptied and the fish remained healthy all the time in them although had to be changed for smaller specimens occasionally. The weekly servicing consists of cleaning the inside of the front glass with a razor blade on a holder. Then with a siphon tube and a bucket, run the end of the glass tube just clear of the front bottom of the tank. A rubber tube should reach to the bucket and once a quick suck is given to the end of the tube the water will flow continually and so enable most of the mulm from the front half of the tank to be removed. Allow some to remain near the back of the tank for the benefit of the plants. About two or three gallons of water may have to be removed from a 24 in. × 12 in. × 12 in. tank and this can be replaced with fresh water. Do not try to filter the water and return it to the tank. It will contain some unwanted matter in solution which should not be returned. Tap water is usually safe and if copper pipes are installed in the house make sure that some water is run off first so that you are not using water which has lain for long in contact with the copper pipes.

Providing care is taken not to over-crowd the fish nor to over-feed them there should be no trouble with the tank. An occasional fast for a day or two will do no harm to the fish and is almost certain to encourage them to clean up the tank and plants from unwanted Algae. When going on holiday never give any extra food before leaving and do not get a kindly neighbour to feed the fish. Most are too heavy handed.

SUCCESS with a TROPICAL AQUARIUM

by JACK HEMS

Barbus nigrofasciatus (above) and *Barbus semifasciolatus*

THE first thing the beginner should know is that plenty of swimming space and no overcrowding are among the basic requirements of fishes in captivity. Hence it follows that the best aquarium tank to buy is the largest one you can afford.

As a rough guide to the number of small fishes (1¼ in. to about 2½ in.) a tank of specified measurements will support, let me say at once that the 18 in. by 12 in. by 12 in. size will support about ten fishes, a 24 in. by 12 in. by 12 in. about 15 fishes, and the 36 in. by 15 in. by 12in. about 26 fishes.

An air-pump (which, by the way, is not an essential piece of apparatus for successful aquarium keeping) may be used to supply oxygen to the water (ordinarily oxygen is obtained from the contacting atmosphere and oxygen-producing plants), but its use will not halt the harmful effects of overcrowding or remove the causes of pollution.

In most cases pollution is brought about by feeding more food than the fishes can possibly clear away in two or three minutes. It is, therefore, of paramount importance to remove uneaten food (and excessive sediment and decaying vegetation) from the aquarium as quickly as possible. This can easily be done by means of a dip-tube or siphon. The water removed should be replaced by fresh—at the same temperature, of course.

The heating apparatus can be dealt with in a few words. For a tank no bigger than 24 in. by 12 in. by 12 in. a 60-watt heater is adequate, but for a tank with measurements of 36 in. by 15 in. by 12 in. or 48 in. by 15 in. by 12 in. (or thereabouts) two 60- or 75-watt heaters, spaced some distance apart, are recommended. The heater(s) should be placed in a horizontal position on the surface of the compost. A thermostat is necessary to keep the temperature at about 75°F (a slight variation either way in 24 hours does not harm). Another essential is a thermometer to indicate the temperature. Make certain, though, that the thermometer you buy is in proper working order.

In a room that is kept comfortably warm, the consumption of electricity is remarkably low. It can be reduced still further—if economy is a crying need—if the outside of the aquarium, with the exception of the front glass, is covered with some insulating material. Polystyrene ceiling tiles, cut to size, are ideal for this purpose.

The top of the aquarium should be covered with a sheet of glass. This can be raised just off the frame on thin slivers of cork or wood. Alternatively, special clips made to hold a cover-glass in position may be obtained from a dealer. A cover-glass serves several useful purposes. For one thing, it lessens evaporation and loss of heat. For another thing, it keeps out a lot of dust and prevents an over-active or scared fish from jumping out.

Except for those who live in a hard water area, ordinary mains water (not, repeat *not* water from the hot water storage tank) suits most aquarium fishes very well. Incidentally, a way to deal with water on the hard side is to boil it first and then dilute it with filtered rainwater collected in a clean plastic or chinaware bowl. A 50-50 mixture is about right.

Bearing in mind that hard water is caused, principally but not exclusively, by the minerals with which it has contact, it is necessary to exercise some care over the choice of a planting medium and any rocks used for

A mixed community of Australian rainbow fish and harlequin fish in an attractively furnished aquarium

decoration. In a word, it is of great importance that rocks and compost should be free of calcium. If a calcium-free compost cannot be obtained from an aquarium shop, then the best thing to do is to obtain some sharp (coarse) white sand from a builder. But avoid like the plague the brown sugar-like sand used for mixing cement mortar. This sand packs too tightly and it never washes clean. Enough sand must be bought to cover the base of the aquarium to a depth of about 3 to 4 in.

Plants must of course be provided. Their important functions are: To absorb carbon dioxide and give out oxygen in exchange, to utilise trace elements excreted by the fiehes as food, and to add attraction to the underwater scene. Furthermore, plants make fishes feel at home. But it follows that plants to do well must have proper light. Electric lighting is in many ways superior to natural lighting because it is so easily controlled in regard to its quality and duration. Generally speaking, it is advisable to allow one 40- to 60-watt tungsten lamp for every sq. ft. of bottom area. On the other hand, if fluorescent lighting is installed, a 20-watt warm white lamp will give sufficient light for a 2 ft. tank and a 40-watt lamp for a tank a size or two larger. From eight to ten hours a day is the time to keep an aquarium lighted. As for the plants themselves, the various cryptocorynes, underwater grasses such as *Sagittaria subulata* and *Vallisneria spiralis*, *Najas* spp. *Elodea densa* and sword plants (*Echinodorus*) seldom fail to make satisfactory growth under the lighting conditions outlined above. A really thick planting along the rear half and ends of the aquarium is advised. Also, it is best to give the plants a week or two to settle down before proceeding any further.

We come to the fishes. For the most part the smaller characins, that is fishes of the family *Characidae*, are well-behaved; that is to say they will not fight one another or destroy the plants, and, therefore, are ideally suited for a decorative aquarium. Moreover, almost without exception they are finely coloured, active, and readily eat live and dried food. Perhaps the handsomest of them all is the 2 in. cardinal tetra (*Cheirodon axelrodi*). The back of this fish is red-brown shading into a brilliant blue-green stripe, that extends from the head to the tail. It is accompanied below by a stripe of vivid red. The belly is silver. The neon tetra (*Hyphessobrycon innesi*) is similarly coloured, but is easily distinguished from the cardinal tetra by its shorter red band and more robust build.

Among the similar sized tetras that run these two close in popularity are the flame fish (*Hyphessobrycon flammeus*), which has two vertical black bars on the shoulders and fiery rear parts, with fins to match; the yellowy lemon tetra (*Hyphessobrycon pulchripinnis*), with black in the dorsal fin, black and yellow in the anal fin, and a splash of red on the eye; and the feather-fin or one-lined tetra (*Hemigrammus unilineatus*), with white edges to the reddish fins and a narrow gold line along the glassy green sides.

The head-and tail-light fish, or beacon fish, is particularly beautiful. It is yellowish to greeny gold, with a narrow black stripe that extends from behind the head to the base of the tail-fin, where it broadens into a spear-shaped marking. A coppery-red 'light' gleams from the top of this marking and from the upper half of the lustrous black eye. Then there is the pristella (*Pristella riddlei*)—a delightful little fish with basic tones of silver and whitish yellow, and the dorsal and anal fins banded with enamel white, black, and yellow. The pretty tetra (*Hemigrammus pulcher*), the bloodfin (*Aphyocharax rubripinnis*) and the pencil fishes of the genera *Poecilobrycon* and *Nannostomus* are charmers, too.

Not closely related to the above species but a characin all the same is the blind cave fish (*Anoptichthys jordani*). This fish, which may reach a length of about 3 in. is believed to be descended from some normal sighted characins (*Astanyax mexicanus*) that became trapped in subterranean waters in southern Mexico in the long ago. The general colour of the blind cave characin is salmon pink overlaid with silver. This species moves about the aquarium with perfect confidence and ease. In short, lack of vision does not inconvenience it at all.

But still there are more: fishes inexhaustible. For instance, the Australian rainbow fishes (*Melanotaenia*), resplendent with myriad jewelled stripes and metallic markings on the head and sides; the air-breathing gouramis, plain silver overlaid with a violet or bluish pink sheen; or gay with vertical stripings of scarlet and blue; or the palest blue adorned with marblings of a deeper blue; or light silvery grey-blue spotted with black. The exceptionally hardy medaka, or Geisha girl fish (*Oryzias latipes*) which, in an improved form, is gold in the body and flashing green around the eyes; and such old favourites as the livebearing mollies, guppies, platys and limias. Indubitably, the beginner in tropical aquarium keeping has a lot to look forward to in beauty and interest.

The bloodfin *(Aphyocharax rubripinnis)*

by Jack Hems

THE bloodfin (*Aphyocharax rubripinnis*) was first made known to tropical aquarists under the false scientific name of *Tetragonopterus rubropictus* or *rubripinnis* in 1906. It is one of the smaller members of the family *Characidae* and hails from the northern half of Argentina. From all points of view it is a most desirable aquarium fish; for among other things it is peaceful, pleasingly coloured, a frequenter of the middle and upper levels of the water, active, hardy enough to stand a gradual fall in the temperature to about 65°F (18°C), and always ready to accept any small live or dried food. Furthermore, it is one of the characins that is not especially difficult to breed.

Ordinarily it grows to a length of about 1¾ in., but exceptionally it will attain 2 in.

The slender body is greenish grey on the back shading down to a bluish band (not very apparent unless the fish is viewed before a strong light), that divides the leaden grey lower sides from the silvery underparts. The fins, with the exception of the pectorals, the tiny adipose, and the upper lobe of the forked caudal, are red. In mature specimens the fins of the female are not so well-coloured as those of the male. Also, she is the larger of the two. The male, when in breeding condition, intensifies his colours to such an extent that his sex should be easily recognisable; a roe-laden female clearly shows an extra fullness in the sides.

A tank measuring 24 in. by 12 in. by 12 in. is recommended for spawning, but one measuring only about 18 in. by 12 in. by 12 in. will suffice. As bloodfins are particularly keen on eating their own non-adhesive eggs some method of saving them must be adopted. A satisfactory way is to cover the floor of the tank with a layer of well-washed pea-sized gravel over-strewn with weighted-down needle- or finely dissected-leaved plants. As will be realised, the plants get in the way of the fish as they swing about after the eggs, and it follows that the eggs that escape being eaten come to rest among the pebbles. It follows, too, that the eggs will reach safety all the sooner if the water is no more than about 6 to 8 in. deep.

Before the couple are placed in the tank it is advisable to separate them for a week or two. For separation, combined with plenty of good food, that is generous helpings of whiteworms, gnat larvae, Daphnia, and the like, seldom fails to bring them into prime breeding condition. It is best to bring them together last thing at night, so that they can get away to an early start—a bright light and a temperature rising to about 78°F (26°C) will see to that—on the following morning. It is important to see that the aquarium cover fits closely; for it is part of the breeding procedure of the bloodfin to take lightning leaps out of the water. After the fish have finished spawning no time must be lost in transferring them to another aquarium.

The eggs hatch out in about thirty hours. For the first day, the fry hang tail-down from the surface of the water, the plants, and the sides of the tank. But sometime on the second or third day they become free-swimming and need food such as *Infusoria* or a fine-particled substitute for a week or more. Then larger food should be placed on the menu. It is hardly necessary to say that some care must be exercised in feeding the fry; for if too much food is given the water will turn foul, which will be unlucky for the fry. To guard, then, against possible pollution, a corydoras catfish may be introduced into the tank to clear up uneaten food. Gentle artificial aeration will also help to offset any loss of oxygen.

In most cases, the fry show quite a lot of colour before three months are out, and at nine months, provided there is no overcrowding, they should be about full size.

A dozen years of BASS

continued from page 436

and analyses the results of experiments carried out by all the members.

These experiments are carried out in a scientific way and hence provide the hobby with interesting and accurate facts. Past experiments include:—plant fertilizers, tests on various fish foods and hatching times of egglaying tooth carp eggs.

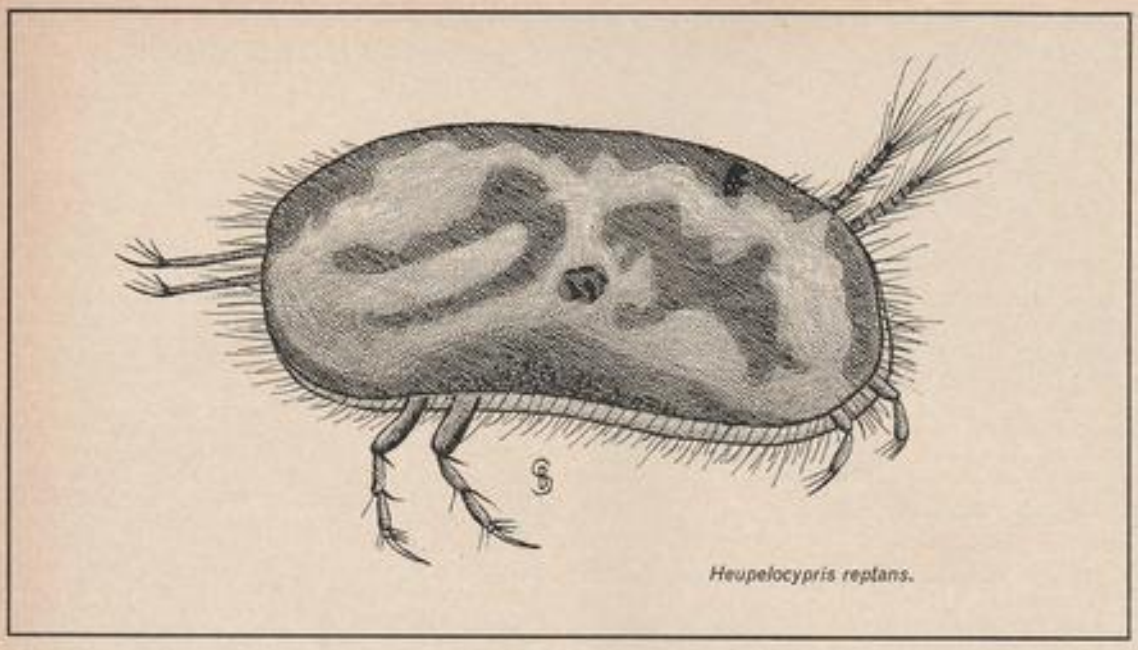
The results are published in the Society's Journal regularly which also includes top class articles by members and well-known continental writers. The Journal provides one of the methods by which all the members can keep in touch.

The Society has vast sources of knowledge with the majority of the leading aquarists as members. Past Presidents include such well-known names as—Dr. Ghadially, Dr. Gwynne Vevers (London Zoo), Frank Arnold and Ray Legge.

At the last A.G.M. one of its founder members Mr. J. L. M. Judge, was elected President, the highest honour in the Society, for his past duties of having been Treasurer since the inauguration of BASS. The Society then completed twelve years of extremely active existence. It is a Society in which members do not just meet and talk, but actually participate in serious activities with a view to furthering knowledge of the Hobby and can be best summed up in a quote by Dr. Ghadially:

> "If the Society is to maintain its purpose and direction it is important that only truly keen and active fish-keepers of repute should be invited to join. If this policy is adhered to we shall have a unique Society; if not, we shall just be another Society similar to numerous others already in existence. I feel that more advanced aquarists need a Society where they do not have to talk in words of one syllable and where more advanced and abstract topics can be discussed and where original observations and experiences reported."

BASS can now look forward to another dozen years of success with the thought that the last have been most successful and rewarding.



Heupelocypris reptans.

Waterlife pests and friends . . . . . by Bill Simms

• The Ostracoda species are admirable scavengers

ALTHOUGH there are over a hundred species of these tiny crustaceans in Britain, it is of little use trying to describe the differences between them for the differences are mainly those of the number and type of bristles on the various limbs. The species illustrated here, *Heupelocypris reptans*, might as well be one of the other species—if I have drawn the hairs or bristles incorrectly.

The shape of all these creatures is about the same, and the size is approximately pin-head, or smaller. The kidney-shaped body is formed of two shells—like a mussel—with the antennae and limbs protruding from the slight opening.

Whichever kind of water is visited, whether ponds that dry up, lakes, marshes, slow streams and rivers, or even ditches, it is fairly easy to find some of these minute creatures. Usually they crawl about on the bottom mud. They can also move about freely on plants, climbing through the tangles of vegetation fairly rapidly. Those that climb most easily excrete a substance that enables them to cling to smooth stems and leaves. Some burrow through the mud, and others swim easily. For this movement the antennae are used, beating somewhat in opposition against the water, and thus directing the little crustacean on a straight course.

Whenever one collects specimens from fresh water, whether plant life or animal, it is likely that one of these little creatures will be found somewhere in the water. And it is as well that they are so prolific for they are admirable scavengers. Their food is any kind of decaying animal or vegetable matter. They are perfectly harmless in the aquarium, and their scavenging habits will always help to maintain the perfect balance we strive to achieve. It is doubtful if they would survive long in a clean aquarium, however, for apart from the absence of their natural food, they would be exposed too openly to fishes.

All the *Ostracoda*, as well as their eggs and larvae, are often exposed to drought conditions and dry out. In this state they merely become dormant. The larvae on hatching from the egg are miniature replicas of their parents—except that they have only three pairs of legs, and not seven like the adults. Just like all crustaceans they must moult to grow, and at each successive moult they advance towards the perfect adult form.

Book review

"THE GOLDFISH", by George F. Hervey and Jack Hems (Faber and Faber, 1968, 42s.).

THE announcement of a second edition of this justly applauded work bears in upon one the undeniable fact that it is now twenty years since the first publication. How the years have flown!

The second edition is nearly 40 pages longer, rich with splendidly informative and, for this reviewer, evocative text which completes what must surely become *the* definitive English-language reference on Goldfish.

There are 251 pages plus 2 appendices and an eight-page bibliography. (Incidentally it is disappointing to note that the authors are still recommending the 1931 edition of Norman's "The History of Fishes" when P. H. Greenwood's authoritative modern revision has been available for nearly five years now).

Hervey and Hems apologise in their preface for their inability to reproduce the plates featured in the first edition; they give us instead sixteen of Laurence E. Perkins' superlative photographs. I think I may say with almost complete impartiality that neither authors nor illustrator have very much at all for which to apologise; the book is really very handsomely illustrated.

There is a very useful forty-page chapter on Anatomy (though this proves to be somewhat of a catch-all title) which offers, as well as the eponymous Anatomy, a great deal of solid morphological, physiological, biochemical and behavioural fact. This section alone would justify the purchase of the book by the beginner who needed to work up a knowledge of the fundamentals of the study. A minor point of criticism here concerns the figure on page 23 showing the Weberian ossicles. Whilst the labels are perfectly correct they treacherously indicate the wrong bones. "Scaphium" should read Claustrum, "Intercalarium"—Scaphium and "Claustrum"—Intercalarium. Looking back at my copy of the first edition I see that the corresponding figure 3 is identical. One may assume that no breath of criticism of the figure has reached the authors in the intervening years for otherwise, since they show in all their work such a painstaking accuracy, they would surely have put it right. The caption to this figure is equally misleading in part.

The nine remaining chapters tell novice and veteran alike all that it is needful to know of the different breeds of fancy Goldfish, the history of their development, the most suitable environmental conditions for their rearing, (another full chapter) how to choose fish and what to feed them and how. There are thirty valuable pages on the treatment and eradication of enemies, diseases and parasites. Breeding merits and receives extensive coverage and there is a chapter on showing Goldfish. Without question this is the Goldfish-fanciers "everything-within".

A final chapter on the Goldfish and the Arts, the apt chapter headings, the often amusing but always illuminating quotations culled from every conceivable source, oriental and occidental, all reinforce the impression that grows steadily upon one throughout, that this is that really rare bird, a civilised book. That it happens to be a work of art which is also a first-class practical text is a tribute to the Hervey and Hems approach to their subject.

Read and be prepared to be at once instructed and entertained.

STEPHEN F. LANGTON.

Solution to Crossword **(see page 429)**

Remedy review

"ALGO-stop", made by Frickhinger Preparations, price 8s. 6d., distributed by Thomas's Ltd., Square Road, Halifax.

THIS German preparation is for the control of algae in freshwater aquaria. It consists of a liquid in a small plastic dropper container, and two tablets which can be broken into sections if required. The preparation is used at the rate of one drop per litre of aquarium water and hence the volume of water in the aquarium has to be converted to litres to get the correct dosage. The appropriate number of drops are added to the aquarium water at the outlet of the filter, to spread the solution evenly throughout the water, and the contents treat 100 litres of water.

Three days after the liquid is added, the aquarium is cleaned of dead algae. Then the appropriate number of tablets are added at the rate of one tablet per 50 litres of water, near the filter outlet. Although the tablets do not dissolve, they are left in the water. The treatment lasts for three months and then it is suggested that the treatment be repeated to stop new growths of algae. It is suggested that the treatment is not carried out if filter carbon or ion exchangers are in use.

I found the treatment to be very effective against strong growths of thread-like algae, but found that it was rather hard on some plants, notably *Ceratophyllum* (Hornwort) and *Cabomba*. Both plants lost a lot of their leaves. However, other plants did not seem to be affected and the treatment has certainly cleared out the algae. It is well worth a try if other methods have failed.

B.W.

Iguana iguana (juvenile).

The Green Iguana

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

THE Green Iguana, sometimes called the Limnean Iguana, by reason of its colour and bizarre shape is a most fascinating saurian. It is a native of tropical South and Central America. Arboreal in habit, it is commonly found in trees, particularly those overhanging water, into which it plunges when disturbed or alarmed. A good climber and swimmer—it can remain under water for a surprisingly long time—this Iguana moves somewhat slowly and heavily on the ground. The adult is greenish grey in colour, marked with darker brown transverse bands. Its thick tongue is non-protrusible and its teeth are fused to the inner slope of the jawbone. This latter characteristic serves to distinguish the species from true Agamids.

Other outstanding features are the relatively large, almost circular, scale on each side of the lower jaw just below the posterior end of the mouth, the low crest of soft, wavy, individual spines extending along the neck, back and first third of the tail and the smaller fringe and heavy dewlap beneath the throat. Green Iguanas are oviparous, the female depositing her clutch of 12-14 soft shelled eggs in February. The eggs are buried in sandy soil and left to hatch.

Unfortunately, because of its need for really spacious accommodation, the adult Green Iguana, which may reach a length of six feet including a tail approximately twice as long as the body, places too great a strain on the resources of the average amateur. From time to time, however, young specimens of much more manageable dimensions are offered for sale at moderate prices and these make delightful inhabitants of a vivarium. I came across some such in a pet shop early last year and lost little time in securing one for myself.

On reaching home I installed it in a vivarium two feet long and heated by a 15 watt electric light bulb, hitherto the exclusive domain of a Ruin Lizard (*Lacerta sicula*) and a Moorish Gecko (*Tarentola m. mauritanica*). This was a mistake as the conditions designed to suit the needs of the Gecko proved to be too dry for the Iguana. The temperature appeared to be quite satisfactory but the lack of humidity produced symptoms of incipient dehydration in the latter animal. Provision of a vivarium floored over half its length with moss and containing a larger water vessel, corrected the trouble.

When first purchased the Iguana was twelve inches long, pale green in colour with darkish brown bars on the tail. The green on the back tended to change to a light brown at times. The throat frill also varied in colour. Sometimes bluish green, on occasion it became a decided pink, probably due to an increase in temperature. This colour change may also have some connection with courtship display in the breeding season.

The long thin tail was flattened from side to side and the

legs longer in proportion to the body than is the case with most species of lizards. This feature was particularly noticeable when the Iguana was moving amongst the branches with which the vivarium was furnished. Although when at rest it flattened itself against a twig, it raised itself well clear of the support when in motion.

These young Iguanas make excellent vivarium animals. Although considerably larger than its companions, mine made no attempt to harass them or regard them as contributions to the menu.

Also in its favour was the fact that it did not spend its time lurking in some hidden retreat but was always on view, either creeping with stately deliberation amongst the branches or stalking determinedly across the floor in pursuit of food. When inclined to rest it spread itself across a flat stone, laid below the electric light bulb, with closed eyes, luxuriating in the heat.

Feeding presented no difficulties although I am not sure that the nutritional needs of these lizards are always fully understood by proprietors of pet shops. On occasion I have seen young Iguanas offered for sale in cages where the only observable food supplies consisted of fruit and lettuce leaves. This may, I feel, give novice purchasers the wrong idea about the animals' dietary requirements.

It is true that adult Iguanas feed largely on tender leaves and fruit, occasionally supplementing them with such small birds and mammals as they can capture, but young specimens are far more addicted to live insects than to vegetable matter. Indeed, mine showed no interest whatever in fruit or vegetation but fed avidly on maggots, flies and mealworms, the latter being by far the most favoured item on the menu.

From the first it showed few signs of nervousness and in a very short time it became tame enough to take mealworms from the fingers and allow itself to be picked up without struggling. Never, neither in the early stages nor later, did it make any attempt to bite.

Young Iguanas require a constant supply of water. Fortunately, from the point of view of the vivarium keeper, unlike some arboreal lizards, they are quite willing to drink from a vessel which they do by lapping up the water with their short tongues.

When visiting the Reptile House at the London Zoo last October I was interested to see a two-foot-long member of the species. Its enclosure contained a small pool set in the gravel covered floor and was furnished with branches, ivy and artificial plants. The arrangement looked attractive and judging from the condition of its inhabitants, suited their needs admirably. Food supplied included lettuce, fruit and that ever useful standby of the reptile enthusiast, locust hoppers. These insects, incidentally, are quite easy to breed and with a little organisation one has small difficulty in maintaining a succession of hoppers which, ranging in size as they do from the tiny, newly hatched insects to the fully developed two inch imago, form valuable food for a wide variety of lizards.

The season is now with us when we may expect to see new importations of lizards in the pet shops. Should these include young specimens of *Iguana iguana*, they are well worth securing for inclusion in the vivarium not only for their individual attraction, but also for their ease of maintenance and lack of aggressiveness in mixed company.

Council for Nature acts on seals slaughter

UNCONTROLLED slaughter of seals in Britain could be prevented if a Conservation of Seals Bill which came before Parliament yesterday (Wednesday, 3 April) were to become law, says the Council for Nature. The Bill provides for the conservation of both grey and common seals in England, Wales and Scotland and in territorial waters. It would make it illegal to kill or take a seal without a licence issued by a Minister of State on the advice of the Natural Environment Research Council. The only exceptions would be where a seal was in the act of causing damage to fishing tackle, or for the rescue (or dispatch) of an injured animal.

A licence would specify the number of seals to be taken, the means to be used and the areas in which the licence was valid. It would be issued, for a twelve month period, only for the maintenance of a healthy breeding stock or the reduction of surplus seals; the prevention of serious damage to fisheries; and for educational or scientific purposes.

The Conservation of Seals Bill had its First Reading in the House of Lords yesterday (Wednesday, 3 April) where it was introduced by Lord Cranbrook. It has been prepared by the Council for Nature after careful consideration of the many interests involved, including sealhunters, salmon fishers, animal lovers and conservationists. The Council for Nature feels that a measure to regularise and ameliorate the existing confused and unsatisfactory situation is overdue. It hopes that this considered attempt at a rational policy for the conservation of seals will receive the goodwill and support of all moderate opinion.

Find the fish

by D. Thiel

The first is in CRY but not in HOWL,
The second is in FROWN and also in SCOWL,
The third is in MERRY but not in GAY,
The fourth is in YESTERDAY and also TODAY,
The fifth is in DYE and also in DIP,
The sixth is in HOP but not in SKIP,
The seventh is in PORCH but not in HALL,
The eighth is in BAT and also in BALL,
The ninth is in SIGNET and also in SWAN,
The tenth is in JANET and also in JOHN,
The eleventh is in TRUNK but is not in CASE,
The twelfth is in FRILL and also in LACE,
The next is in LID but not in STOPPER,
The last is in POLICE but is not found in COPPER.

Solution on page 442

Herpetological notes

by M. Peaker, B.Sc.

RATTLES

IN England, I had two vivaria, one 4 ft. long, 2 ft. wide and 18 in. high, the other 3 ft. by 15 in. by 15 in., specially designed for small and medium-sized constricting snakes from temperate regions. Both had large pebbles for floor covering and housed a succession of specimens from Aesculapian snakes (*Elaphe longissima*) to Coachwhips (*Masticophis flagellum*). Since mice or other small rodents were usually provided for food, the feeding methods of a number of species could be compared.

One particular action of interest I first saw in a Western Coachwhip (*Masticophis flagellum testaceus*). As a specimen stalked its prey, it vibrated its tail and rattled the gravel loudly. The mouse immediately stopped its activity, listened and sniffed attentively. At this moment while the mouse was still investigating the noise, the head of the snake struck and the mouse was devoured. Since this first occasion I have seen even more pronounced tail vibration a number of times in the European Four-lined Snake (*Elaphe quatuorlineata*) with exactly the same effect. Such a behavioural mechanism seems to be advantageous in that the attention of the rodent is held while the snake's head strikes from a different direction.

It may be that the rattle of the rattlesnakes (*Crotalus* and *Sistrurus*) might have been developed primarily for its use in attracting and holding the attention of the intended prey rather than as a warning device against interference by large mammals. The acquisition of rattling segments on the tail might then confer an advantage in holding the attention of the rodent while the snake injects venom. This thesis gains support when the feeding habits of rattlesnakes are considered. Usually, they hunt at night detecting their warm-blooded prey by the sensory pits situated between the nostrils and the eyes. These pits detect the warmth of a small rodent. At night, of course, the prey cannot be seen clearly, if at all, so that if the strike was made "blind," relying only on the pit detectors, the mouse may have hopped away. However, if the rattling segments were to be vibrated, the mouse, on perpetual guard might cease its activities to listen and sniff in order to try to determine the cause of the sound. This would give the snake time to pin-point the position of the prey and to strike accordingly. The use of the rattle as a warning device might then have followed as a secondary development.

This hypothesis is, of course, purely speculative but I would be pleased to hear from any herpetologists who have made observations on this tail-vibrating behaviour in snakes.

FROGS . . . IN VIVARIA

One of the most difficult problems facing the keeper of the true frogs (Ranidae) is the damage they may cause to themselves by leaping in a confined space. Usually, unless a large outdoor or indoor enclosure is available, the frogs severely damage the tip of the snout. This injury allows bacterial and fungal parasites to enter and unless treatment is swift, the animal usually dies. Even if a cure is effected, the snout is usually disfigured. The most difficult situation to cope with is the transporting of specimens. If unaccompanied, a box, padded with high-grade cotton-wool is ideal and damp newspaper, paper handkerchiefs or soft toilet paper should be added. The frog should be washed clean of any adhering earth before it is packed in order to prevent abrasions of the skin.

If frogs are being moved personally, large polythene bags are ideal. The polythene is so soft that the frog remains uninjured until it can be released into a large enclosure. Again, damp paper makes good packing material and the bag should be distended with air before a rubber band is fastened around the neck. The bag can be distended by blowing into it following several deep inhalations. Only a small part of the air from each breath should be used—the "dead-space air" so that the oxygen or carbon dioxide content is not changed. The air in the bags should be changed every few hours. This method is very satisfactory and I have transported frogs for several days in large polythene bags packed into a "grip" travelling bag without loss.

Apart from these methods, a can or wide-necked polythene bottle which is perfectly smooth on the inside may be employed and this is particularly useful for aquatic specimens such as *Xenopus*. The lid should have holes punched in it from the inside.

. . . AND ON TAPE

Recent papers in the *British Journal of Herpetology* have called attention to the existence of a number of records containing tracks of amphibians calling. With the advent of easily-transportable tape recorders, there is the possibility that many amateurs will be able to make recordings of many of the European anurans. Moreover, many exotic amphibians regularly call in vivaria and these sounds would not be difficult to collect. In the wild a dish reflector for the microphone would probably be necessary to exclude extraneous sound but in the vivarium, the normal home equipment would be fully adequate. High-fidelity in the upper frequencies would be unnecessary since any sounds produced above 10,000 cycles per second are unlikely to be of any biological significance since the ear of anurans cannot detect sound of a greater frequency than this, in comparison with 15,000 in man.

Solution to "Find the fish" (page 441)

Answer: *CORYDORAS JULII.*

our readers write

Address letters to The Editor, *The Aquarist*, The Butts, Half Acre, Brentford, Middlesex

Long-lived

FROM time to time letters have appeared claiming a new record or inquiring about the subject of the length of life that some fish attain. As far as I am aware there is no book where these have been collected together.

I write, though, not to claim a record, but to pass on the information that an *Astyanax bimaculatus* of mine was kept in my possession for 17½ years before it succumbed to a tumour behind the eye. It would be at least two years old when I purchased it making it about 20 years old when it died.

I would be grateful to know if other readers have had any experience with this fish and particularly if their specimens have lived a longer length of time.

Yours faithfully,
A. RENNIE,
38 Kings Road, Cheadle Hulme,
Cheadle, Cheshire.

New Society

THE Newtownabbey Aquarist Society was formed for tropical and coldwater fishkeepers, and as our district is still in the process of building, we were very fortunate in getting really comfortable rooms to hold our meetings.

We meet fortnightly and at present have 12 members with prospects of at least another six. Our difficulty is getting in touch with experienced aquarists able to give talks on fish or plants. We have really keen members and any hints or help you or your readers can give would be gratefully accepted.

Yours faithfully,
ROBERT MCDONALD (*Hon. Sec.*),
31 Doonbeg Drive, Rathcoole,
Newtownabbey, Co. Antrim, N. Ireland.

Fish Food Prices

IT is Messrs. Herb-Royal, Ltd., in their reply to Mr. A. J. Wright, of Breconshire, who have their figures wrong.

They say: "To this (the 16.67%) must be added the proportional increase in freight charges, etc." But this is just what must not be added. These charges at the old rate were included in the old price; since they are not all incurred *outside* this country, they cannot have gone up *as much as* the full 16.67%; however, even assuming that they have all gone up by this amount, the sum of $x\%$ of a plus $x\%$ of b cannot be more than $x\%$ of $(a+b)$. So Tetramin ought not to be costing more than 116.67% of 7s. 6d., which is 8s. 8d. or 8s. 9d. There is, therefore, a 2d. or 3d. "easement" in the margin somewhere (though not for Mr. Wright or for me!).

RONALD VINCENT SMITH,
17 Rodney Road, New Malden, Surrey.

Sex Linkage

DOES sex linkage occur in some species of fish as it does in birds?

In the past I have practised sex-link breeding in poultry by mating a Rhode Island Red (golden) cock to a white Wyandotte hen (silver). The chicks were gold females and silver males. The male having passed on his colour only to his daughters. This also works with budgerigars and pigeons. There is, of course, much more to it than this, but within certain bounds it works out.

Betta splendens respond to some extent.

I have now bred from a Black Lace Male Angel and a Silver female. The fry of two broods are each composed of about 50 per cent. light and dark fry. Is there any likelihood of the dark fry being females and the silver, males?

I know I can do as Asquith said, but wondered if this was a way of sexing Angels.

C. O. BARSBY,
Fallings Park, Wolverhampton, Staffs.

Pen Pals Wanted

I HAVE read your magazine with much interest. I would appreciate it very much if you could place me in contact with British aquarists who would be interested in corresponding with me as pen pals. I am 24 and specialise in catfish and tetras. Many thanks.

Yours faithfully,
FRED CHIN,
34-43, 72nd Street, Jackson Heights,
New York, 11372, U.S.A.

Vacancies for Large Fish

WE are again offering homes to large fish which are fast outgrowing their tanks; these are required for the local Aquarium which this Society has taken over. We will arrange collection up to 60 miles radius.

COLIN GEORGE, Secretary,
Eastbourne Aquarium Society,
6 Hurst Road, Eastbourne, Sussex.
Tel: 32325.

New business with an educational policy

Opening of "4-Ways Tropical Aquaria" at Welling, Kent

A NEW centre of interest for aquarists has emerged at Welling, in Kent; though "emerged" is too modest a term for an opening characteristic of a film premiere, attended by distinguished guests and with a fine sense of presentation. But if the introduction was planned as a "spectacular," the policy of the new enterprise has a serious purpose, combining an active educational function within its commercial operation.

The proprietor of the "4-Ways Tropical Aquaria," Mr. Alan Petherick, has decided views on the importance of aquaria to schools and study groups. A visit by 40 pupils and two teachers soon after the opening was a forerunner to visits for note-taking and sketching.

It was this aspect which persuaded the Mayor of Bexley, Mrs. F. H. Schuch, J.P., to depart from her policy of not officiating at the opening of commercial premises. Accompanied by 24 councillors, the Mayor formally opened the Aquaria before a packed gathering and instead of cutting a tape, she "went fishing" in a tank of X-ray Tetras in an endeavour to net an initial catch. The fish defied the Mayoral skill, but in every other respect the ceremony went off brilliantly and congratulations were generous for the proud owner's enterprise.

The "4-Ways Tropical Aquaria" presents a pleasing and strikingly colourful scene from the moment of entering the big display space and sales area. Modern fittings combine with the gleaming floor and tasteful lighting to give the ideal setting for the great array of tanks, which immediately command attention.

Standing four and five deep, the 100 tanks line the walls in full view, offering close inspection. A pleasing effect is given to the display by the use of coloured lighting in the tanks, in a range of colours that lend a tropical atmosphere to the scene. This Gro-lux lighting is used most effectively here as a sales tool to enhance the effect, but Mr. Petherick quoted American and other opinions that it provides better conditions for the fish and keeps down the growth of algae.

Beyond the main Sales area, space is taken up with more tanks and on a lower floor is the furnished tank department, where different types of installation can be seen in a setting that recreates the impression of an indoor aquarium for the family at home. Elsewhere in the building are the quarantine and storage tanks, and the normal stock at "4-Ways" runs at an average of 15,000 fish. Initially, they were made up of tropicals and cold-water varieties, but marines have been added. Plants are there too in profusion, and some 10,000 are bought every month.

Mr. Petherick is exceptional among professional aquarists in that he went into business a few weeks ago with no previous commercial experience. He was a crane-driver; but he has for many years been an ardent hobbyist in fish-keeping. A 5-ft. tank at home was his first venture and this, combined with an interest in angling, led to a consuming interest in fish. He read widely and studied the subject at first hand wherever he could visit installations, and has made a special study of fish diseases.

He has learned the hard way, and has had his share of set-backs. One of his first consignments was held up due to an emergency in the airline schedule, and of the 7,500 fish despatched to him, only 23 were alive on arrival.

He plans to develop a "fish-clinic" at Welling where customers can bring ailing fish for advice and treatment. The stock is examined daily and where signs of white spot or other diseases are seen, the tank is clearly marked "Quarantine—not for sale." In every way, his aim is to establish confidence in the quality and condition of whatever he sells, and to guide his customers away from the pitfalls that beset the beginner.

Mr. Petherick's ambition is to have the best aquarium business in the country, and if enthusiasm can achieve it he is well on the way. In terms of appearance and presentation alone, the "4-Ways Tropical Aquaria" has a standard that would take a lot of matching, and its owner has been encouraged by the comments of visitors from as far afield as Devon.

There have been as many as 300 visitors in the shop at one time, and in the busy periods the staff of 12 are fully stretched. Here again the emphasis on appearance is apparent in the smart uniforms of the staff. The proprietor's right-hand man, Mr. Terry Blundell, is a capable and well-informed lieutenant with considerable knowledge of fish ailments and antibiotics.

On the question of personal favourites among fish, Mr. Petherick admitted to a special interest in Discus (which he regards as an aristocrat among tropical fish) and Angels. He is at present making up a 20-ft. tank at home, and has plans to develop his already wide experience of breeding. He has visited Hong Kong, Malaya, and Singapore and plans a further visit to the Far East to extend his contacts there.

In a business policy that takes in educational, clinical, and commercial activities, Mr. Alan Petherick is kept more than busy—but never too busy to attend to the unusual request from a customer. One such was the lady who wanted to surprise her husband by having a sizeable tank installed in her home in the few hours before he returned from work. It was there, fully stocked and furnished, as an example of the enterprise and energetic approach of Mr. Alan Petherick and his team at Welling.

W.J.Y.

New Aquaria at Welling

Above: A corner of the spacious showroom and sales area at "4-Ways Tropical Aquaria", where coloured lighting in the tanks is a pleasing feature of a lay-out designed for ease of selection.

Left: The Mayor of Bexley, who officially opened the business in recognition of its educational policy, shares a joke with Mr. Alan Petherick, the proprietor.

Right: Foods and accessories are displayed on sloping shelves, with maximum visibility and brilliant lighting.

News from AQUARISTS' SOCIETIES

AMONG recent attractions at the **Blackpool and Fylde A.S.** meetings have been a film show. Four films were enjoyed by a good attendance of members; the first was a light animal comedy called Wing, Fang and Claw; second was a colour film Sea Angling off the South West Coast of Ireland; these two were hired from Rank Films; third was The Life Cycle of a Newt, and the fourth Setting up a Freshwater Aquarium showing a boy and girl on expeditions to rivers and ponds for gravel, rocks, plants and fish, two very interesting films hired from Blackpool Education Authority. Clubs interested in film shows should contact their local Education Authority as most of them have films for hire connected with the hobby. Table show results: Singleton Trophy (single fish): 1, C. Jones; 2, B. Simmons; 3, A. Marsden. Breeders (Livebearers): 1, B. Simmons. Breeders (Egglayers): 1, B. Simmons. Recently Chris Jones gave a very informative talk on fish breeding and rearing for showing. His talk brought about some good discussion between members who had a very enjoyable evening. The annual Open Show will be held at the Harrowside Solarium on Sunday 9 September.

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AT the first of four table shows between **East London A.P.A., Southend and Leigh, Thurrock A.S. and Basildon,** there were some ninety members with an entry of 105 jars of fish on show. East London take this opportunity of thanking their competitors and for the splendid support from their members and also Mr. C. Creed, F.B.A.S., for undertaking the judging. Results. Barbs: 1, Mr. Green (E.L.A.P.A.); 2, Mr. Edwards (Southend); 3, Mr. Capone (Southend); 4, Mr. Long (E.L.A.P.A.). Fighters: 1, Mr. Dunn (Southend); 2 and 3, Mr. Durrant (Thurrock); 4, Mr. Myres (E.L.A.P.A.). Platys: 1, Mr. Norris (Southend); 2, Mr. Dodkins (E.L.A.P.A.); 3, Mr. Jusope (Thurrock); 4, Mr. Cherwright (Southend).

* * *

AT the first meeting of the **Brighton and Southern A.S.** to be held in April a slide/tape lecture on loan from the F.G.A. provided an interesting and entertaining evening for members. This consisted of a colourful and lucid account of the travels of Mr. Jim Kelly through the Everglades in Florida. He showed how he had been fortunate enough to fly to Miami in a private plane and how during the flight he had encountered a thunderstorm. There followed an account of his exploration of the Everglades jungle with some good photographs of the wild life abounding and, in particular, one or two unfriendly-looking alligators. Mr. Kelly showed many of the tourist attractions and pictures of the local Indian tribe who appeared to have flourished under the influence of tourism. This proved to be a very enjoyable meeting in view of the sometimes humorous commentary coupled with a wealth of excellent colour slides.

A record number of members attended the second meeting of the month producing twenty-nine entries in two table shows for Corydoras Catfish and A.O.V. Catfish. Mr. Brian Baker from Uxbridge judged the entries in front of members and explained how each entry had been pointed. This was very informative. The following awards were made:—Corydoras: 1, V. Aldis, 2, Mrs. L. Jeffreys; 3, M. Whittington; 4, N. Short. A.O.V. 1, P. Wyndham; 2, Miss E. Jeffreys; 3, D. Seper; 4, J. Kail. Any person interested in joining the Society will be assured of a warm welcome at any fortnightly meeting held at the Prince George, Trafalgar Street, Brighton on a Wednesday evening.

* * *

AT the April meeting of the **Pontefract and District A.S.** members held a discussion on White-Spot and also the forthcoming trip to a well known fish farm in June. Mr. D. Cohen judged the Table Show, results being Guppies: 1 and 3, G. Thickbroom; 2, J. Thompson. Platys: 1, J. Goodall; 2, T. and T.; 3, G. Thickbroom. Swordtails: 1 and 2, J. Goodall; 3, G. Thickbroom. Mollies: 1, and 2, T and T; 3, S. Thomas.

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THE Annual inter-club show between **Yeovil and District A.S. and Taunton A.S.** was held in April. The society with the best fish on exhibition hold the Shield for the year. Winning Exhibits were as follow:—Tropical: 1, Barb (Taunton); 2, Retail Black Shark (D. Finn), Yeovil; 3, Moonlight Gourami (A. Nicholls), Yeovil. Coldwater: 1, Bristol Shubunkin (S. Langdon) Yeovil; 2, Black Moor (W. Reeves) Yeovil; 3, Bristol Shubunkin. Yeovil and Taunton. Yeovil were the winners for 1968, and the Judge was Mr. Matley of Bournemouth. Awards for Novice class: 1, Taunton; 2, Yeovil Red Platy (Mrs. Pilton); 3, Yeovil, Black Mollie (Miss B. Hulbert). At the Society's April monthly meeting a five-inch coldwater show was held the member with the best exhibits being V. Collins winning 1, 2 and 3 places with Veiltails.

* * *

THE **Reigate and Redhill A.S.** was pleased to be joined in April by members of **Crawley A.S. and Mid-Sussex A.S.** A picture quiz commenced the proceedings, and this was won by Reigate member P. Collins. The Inter-club Table Show for Livebearers, Barbs and Characins was won by Mid-Sussex, as was the "fishy" general knowledge quiz. The meeting ended with Eric Large, who judged the fish, discussing the merits of those on the bench, to the interest of the 65 people present.

* * *

AN expert on Reptiles and Amphibians Mr. King kept the members of **Yate and District A.S.** interested when he gave a most informative talk on these creatures. This club has recently been reformed and it is gratifying to see the intense interest and support that new and old members are showing in the club's activities. One special event will be the one day show on 7 September.

The table show for April was Angels and Barbs with the results as follow:—Barbs: Open Class: 1, C. Calway; 2, F. Brown; 3, P. Wright. Novice Class: 1, D. Crook; 2, E. Verinder; 3, D. Walsh. Angels: Open Class: 1, K. Watkins; 2, A. Evans. Novice Class: 1, K. Watkins; 2, A. Evans.

* * *

THE result of an inter-Club Table Show between **Runnymede A.S.** and their visitors **Weybridge A.S.** was a win by 920 to 905 points for the host club, the individual winners being 1, R. Biggs (Runnymede); 2, H. Aylott (Weybridge); 3, P. Grosvenor (Runnymede); 4, D. Lambert (Weybridge). The speaker for the evening gave an enlightening talk on Biological filters and this proved very interesting as many an evening is spent discussing these at club meetings without getting the right answers.

The club is once again taking part in the Staines carnival hobbies section by putting on a stand of fish. The table shows which are held on most club nights are being well patronized along with films and lectures on the hobby.

* * *

THE third annual show of the **Stockton-on-Tees A.S.** was held recently the results being as follow: Furnished Aquaria: 1, T. Stephens. Furnished Jar: 1, G. Scarth, 2, M. Shields; 3 and 4, Mrs. Batty. Fighters: 1, 2, and 3, Mr. Whitelock; 4, Mr. Atherton. A.O.V. Labyrinth: 1, Mr. Whitelock; 2, Miss Dodd; 3, Mr. Rowbottom; 4, Mr. Watson. Large Cichlids: 1, Mr. and Mrs Pattison; 2, Mr. P. Carey; 3, W. Emmerson; 4, Mr. Tate. Barbs: 1, Mrs. Batty; 2, C. Brown; 3, P. Carey; 4, Mr. Lancaster. Characins: 1, P. Sonley, 2, Mr. Skoyles; 3, L. Winn; 4, Mr. Tate. Platys: 1, Mr. Sykes; 2, Mr. Skoyles; 3, Mrs. Batty; 4, C. Bridge. Swordtails: 1, J. Chamberlain; 2, and 4, J. Martin; 3, R. Davison. Mollies: 1, L. Collins; 2, Mr. Turnbull; 3, Mr. Long; 4, Mr. Rowbottom. Scavengers: 1, Mr. Sykes; 2, Mr. and Mrs. Pattison; 3, P. Carey; 4, L. Collins. Guppies: 1, J. Middleton; 2, Mr. Skoyles; 3, T. Walls; 4, Mr. Dodd. Dwarf Cichlids: 1, J. Chamberlain; 2, F. Bell; 3, R. Davison; 4, Mr. and Mrs. Clenners. E.T.L.C.: 1 and 2 and 3, P. Sonley; 4, Mr. Rawlings. Rasbora-Danios: 1, G. Scarth; 2, Mr. Fairclife; 3, M. Cooper; 4, Mr. Bridge. A.O.V.: 1, Mr. Rowbottom; 2, P. Carey; 3, B. Walls; 4, P. Sonley. Breeding Pairs (egglayers): 1, M. Cooper; 2, Mr. Rowbottom; 3, P. Carey; 4, D. Keighley. Breeding Pairs (Livebearers): 1, W. Bowman; 2, Mr. Dodd; 3, Mr. Whitelock; 4, Mr. Osman. Breeders (Egg): 1, Mrs. Batty; 2 and 4, P. Sonely; 3, R. Davison. Breeders (Live): 1, Mrs. Batty; 2, G. Scarth; 3, R. Davison; 4, Mr. Rowbottom. Coldwater: 1 and 3, Mrs. Hunt; 2, A. Trotter; 4, Mr. Fairclife. Best Fish in Show: Thicklip Gourami—Mr. Whitelock.

* * *

AT the recent annual general meeting of **Clitheroe and District A.S.** the Shield for most points gained at table shows during the past year was won by Master W. Crook, in a really close finish. The retiring officers were re-elected for the coming year. All correspondence should be addressed to the Honorary Secretary, T. Hallett, 68 St. Huberts Street, Gt. Harwood, Near Blackburn, Lancs. Meetings are held on the second Wednesday of every month at the Dog & Partridge Hotel, Wellgate, Clitheroe, commencing at 8 p.m. and all are welcome.

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THE following officers were elected at the annual general meeting of the **Roehampton A.S.** Chairman/Secretary, J. A. Waller; 39, Bramley House, Alton Estate, London, S.W.15; Treasurer, F. Furniaux; Show Secretary, D. Yorke; Committee members, J. Hughes and D. Lambourne. The date of the Club 'Open' Show is Sunday 8th September and further information will be available at a later date.

* * *

THE results of the **Nelson A.S.** Annual Show held at the Nelson Civic Hall on Easter Sunday were as follow:—Guppies: 1, R. Dickens (Nelson); 2, P. Hodinson (Salford); 3, R. Lees (Ashton). Swordtails: 1, R. Robinson (Aireborough); 2, R. Grimshaw (Sunny Brow); 3, W. Chapman (Valley). Mollies: 1, A. E. Gardner (Heywood); 2, J. Whiteley (Aireborough); 3, Mrs. Burnap (Aireborough). Platies: 1, Miss B. Kaye (Huddersfield); 2, A. E. Gardner (Heywood); 3, A. Beasley (Osram). Characins (up to Rocaceus): 1, Mr. P. Barrit (Aireborough); 2, M. and B. Tonge (Oldham); 3, M. Jones (Valley). Characins (over Rocaceus): 1, J. Whiteley (Aireborough); 2, J. Murray (Belle Vue); 3, Mr. and Mrs. Standen (Loyne). Barbs (up to Nigger): 1 and 3, G. Kershaw (Heywood); 2, A. Beasley (Osram). Barbs (over Nigger): 1 and 3, Mr. Page (Valley); 2, H. P. and H. (Gorton). Sharks and Flying Foxes: 1, Mr. P. Barritt (Aireborough); 2, M. Goodchild (Valley); 3, Mr. R. Dickens (Nelson). Fighters: 1 and 3, Mr. R. Taylor (Aireborough); 2, C. Walker (Ashton). A.O.V. Anabantids: 1, D. Liedger (Combrook); 2, P. and H. (Gorton); 3, F. Ledger (Top Ten). Catfish and Loaches: 1, W. Parkin (Huddersfield); 2, Mr and Mrs. Standen (Loyne); 3, G. Kershaw (Heywood). Angels: 1, Mr. W. Harley (Nelson); 2, J. Murray (Belle Vue); 3, D. Carles (Nelson). Dwarf Cichlids: 1 and 2, A. E. Gardner (Heywood); 3, M. and B. Tonge (Oldham). A.O.V. Cichlids: 1, E. Lees (Ashton); 2, R. Taylor (Aireborough); 3, W. Chapman (Valley). Rasboras, Danios and Toothcarps: 1, P. Barritt (Aireborough); 2 and 3, P. and H. (Gorton). A.O.V. Tropical: 1 and 3, Mr. and Mrs. Standen (Loyne); 2, Mr. Hampson (Horsforth). Pairs Livebearers: 1, R. Robinson (Aireborough); 2, Mr. Truby (Nelson); 3, Mr. Dickens (Nelson). Pairs Egglayers: 1, A. Beasley (Osram); 2, D.

Campsty (Loyne); 3, Mr. and Mrs. Standen (Loyne). Breeders (livebearers): 1, R. Robinson (Aireborough); 2, Master A. Kaye (Huddersfield); 3, Mr. Burnap (Aireborough). Breeders (Egglayers): 1, J. Whiteley (Aireborough); 2 and 3, A. Beasley (Osram). Juniors (under 15 years): 1, D. Robinson (Aireborough); 2, Miss K. Hodgetts (Independent); 3, Miss B. Kaye (Huddersfield). Any Variety Coldwater: 1 and 2, S. Walsh (Accrington). 3, Mrs. Baxter (N.G.F.). Best Fish in show 'Pantail Goldfish' owned by Mr. S. Walsh eligible for "Champion of Champions". There was a record 303 entries. 23 of which were in the Junior Section.

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THE officers elected at the annual meeting of the **Horsforth A.S.** were: Chairman: Mr. R. Hampson; Secretary: Mrs. B. Helm; Treasurer: Mr. M. Pollard; Show Secretary: Miss J. Helm. The meeting closed with a raffle and auction.

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DETAILS of recent Table Shows of the **Brent A.S.** are as follows: Labyrinths: 1, C. Hooper; 2, J. Line; 3, J. Reed; 4, R. Fox. Fighters: 1, J. Line; 2, T. D. Smith; 3, R. J. Waldron. Best in Show: C. Hooper. Guppies: 1, Rev. Father Lewis; 2, D. Deeling; 3, R. Fox; 4, J. Raymond. Mollies: 1, C. Swinburne; 2 R. Fox; 3, F. Brown; 4, J. Reed. Cichlids: 1 and 4, C. Hooper; 2, F. Brown; 3, P. Shrimpton. *Best in Show: Rev. Father Lewis.*

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THE Annual General Meeting of the **Smethwick and District A.S.** was held in April, and the following Officers and Committee were elected: Chairman: G. Haynes; Vice Chairman: G. C. Wyse; Secretary: D. L. Black; Treasurer: J. Harris; Show Secretary: R. F. Biddle; Newsletter Editor: R. Welshie. Committee: S. Whitehouse, D. H. Johnstone, E. W. F. Smith, A. Willetts, H. Ainge, D. Shepherd.

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THE **East London A.P.A.** will be holding their Annual Show on Saturday, 27th July at Ripple Road School, Ripple Road, Barking, benching 6 p.m. Friday, 26th-10 a.m. Saturday, 27th July. This will be an Open Show consisting of Club and Individual Furnished Aquaria, Breeders Classes, Pairs of Livebearers and Plants.

The I.G.M. Trophy, a worthy cup, to be awarded to the winner of the Club Furnished Aquaria. An F.B.A.S. Championship Class Trophy to be won outright for A.V. Characin Breeders Class. Plaques will be given for First, Second and Third in their classes. Ample refreshment will be available. Enquiries to Show Secretary, J. Smith, 2, Hatch Grove, Chadwell Heath, Romford, Essex.

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THE **Hounslow and District A.S.** continues to enjoy considerable success in both the competitive and social fields. The Open Show this year is being held on Saturday, 14th September, at the Youth Centre, Cecil Road, Hounslow. Last year there were over 600 entries and it is intended this year to aim for 1,000 entries.

Social events in the Society are also being very well supported. The latest one undertaken, and as usual superbly organised by the Social Secretary Bob Nelhams, was a tour of the old London pubs. This was a coach trip, and it took in the Prospect of Whitby, Dirty Dicks, and other historic inns. The Society has been active in another field recently when the Mayor of Hounslow held a Grand Fête at Chiswick House in aid of the Heart Research Foundation. Hounslow and District put on a really splendid display of tropical fish which aroused tremendous interest in the visiting public. A considerable sum, by way of collecting boxes, was raised for this very worthy cause.

The Table Shows at the Society's regular meetings are still a feature of great interest and recent talks given by Club members have included subjects ranging from the care of aquatic plants to breeding cichlids. New members to the Society are always welcome, and details can be obtained from the Secretary, D. J. Woodward of 34, Uxbridge Road, Hanworth, Middlesex.

THE **Meersbrook A.S.** held their fifth meeting on 11th April, when 35 people were present to listen with great interest to a talk from Mr. J. Dernie from Worksop. Recently the Society visited Chester Zoo and Aquarium. The secretary is Mr. J. Price, 641, London Road, Sheffield, 8.

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THE main item on the agenda at the **New Forest A.S.** April meeting was a slide lecture on "Water Gardening" by the Highlands Water Gardens, showing the methods of choosing a site, construction and planting garden pools. The table shows have been well supported recently. Recent results are:—Characins: 1, M. Lee, 2, R. Menhennett, 3, A. Williamson, 4, D. Duckwell. Cichlids: 1 and 3, M. Lee, 2, K. Newton, 4, A. Williamson.

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AN interesting meeting of the **Guildford and District A.S.** was held in April, when an illustrated lecture was given by Dick Armstrong of the British Killifish Association. A lively discussion ensued, during which much useful information was received. In appreciation of the most informative lecture, a vote of thanks was proposed by Peter Lee, Chairman of the Society.

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NEWS from **Lanarkshire A.S.** for the last few months covers plenty of activity. At the February meeting the club were indebted to Dr. A. Young for coming along at virtually no notice to deputise for the intended lecturer who was unable to come owing to ill health. Dr. Young conducted a quiz between two teams of club members which proved exciting as well as interesting. The results of the table show that evening were as follows: Male Swordtails: 1, O. Sharkie; 2, H. Christie; 3, M. Kellock. Female Swordtails: 1, D. Jamieson; 2, A. MacDonald; 3, W. Campbell. Silversides: 1, A. Christie, 2, S. Marshall. White Cloud Mountain Minnows: 1, J. Hudson; 2, M. Kellock; 3, S. Thomson. Swordtail (Breeders): 1, S. Marshall, 2, A. MacDonald; 3, P. Haggarty. White Cloud Mountain Minnow Breeders: 1, R. Patterson; 2, J. Hudson.

At the March meeting Mr. J. Wilson of Edinburgh gave the club a very interesting and instructive lecture on breeding characins, a subject on which he proved himself very much an expert. The results of the Table Show were as follows: Yellow Wagtail Platy: 1, J. Fairley; 2, J. Corrigan; 3, H. Christie. Red Wagtail Platy: 1, R. Paterson; 2, A. Christie; 3, S. Naismith. Platy Breeders: 1, D. Jamieson; 2, P. Haggarty; 3, S. Thomson. The April meeting of the L.A.S. not only had the largest attendance of over one hundred persons but also attracted the largest Table Show (73 entries). The Programme for the evening included a lecture and film show by Dr. R. E. Evans entitled "Fish on Film" which proved very interesting and was enjoyed by all the members. The results of the Table Show were as follows: Characins "A": 1 and 2, D. Jamieson; 3, R. Paterson. Characins "B": 1, P. Haggarty; 2, M. Kellock; 3, J. Smith. Characins "C": 1, O. Sharkie; 2, J. Corrigan; 3, P. Haggarty. E.L. Toothcarbs: 1 and 3, K. Jenkins; 2, R. Paterson. Breeders Characins: 1, 2 and 3, E. Watson.

The Society holds its meetings on the first Friday of every month and visitors are assured of a very warm welcome. Further details can be obtained from the Secretary, E. Watson, 8 Westmoreland Street, Glasgow, S.2.

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AMONG the Newsletters received from the various societies special attention is directed to that issued by the **Hutton Grammar School A.S.** This takes the form of a term bumper newsletter instead of a monthly foolscap issue and has a number of interesting articles. Attention is also drawn to the third Junior Show which is being held on the 29th June, and secretaries are requested to send details of juniors they know (under 18 and/or still at school) and how many schedules are required. Any postages incurred will be refunded. The secretary is Mr. D. Swindlehurst, 25 Hennel Lane, Walton-le-dale, Preston, Lancs.

MEMBERS of the **Merseyside A.S.** recently gathered to hear the Braz Walker show, a slide/tape lecture which proved thoroughly enjoyable. A recent Table Show resulted as follows: Livebearers: 1, K. Parkes; 2, D. Broadbent; 3, R. Moorcroft. Small Barbs: 1, R. Moorcroft; 2, K. Parkes; 3, H. Kitchen. Large Barbs: 1, K. Parkes; 2, F. Mulla; 3, T. G. Wayles. Cichlids: 1 and 2, W. Smith; 3, F. Mulla. Catfish and Loaches: 1, N. Kirkby; 2, R. Moorcroft; 3, D. Incledon. Sharks and Flying Foxes: 1, R. Moorcroft; 2, N. Kirkby; 3, W. Smith. Gouramies: 1, T. G. H. Wayles; 2, P. Clarke. Rasboras: 1 and 2, W. Smith; 3, D. Broadbent. Pairs: 1, N. Kirkby; 2, W. Smith; 3, F. Mulla. A.O.V.: 1, F. Mulla; 2, W. Smith; 3, R. Moorcroft. Juniors: 1 and 3, David Moorcroft; 2, Barry McDermott.

The award for the Best Fish in Show was won by Fred Mulla with an Elephant-Nose Fish.

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AT the April meeting of the **Bournemouth A.S.** an attendance of over forty members extended a special welcome to the Club's President, Mr. Jim Scott-Morgan, who attended the meeting after an enforced absence of some months. The members enjoyed a talk, illustrated by slides, by Terry Gledhill of the Freshwater Biological Research Association, from East Stoke. He is also the Chairman of the Poole and District A.S.

The table show of the month was judged by R. Matley, with the following results: Guppies: 1, Mr. Wise, 92 pts.; 2, Mr. Jim Scott-Morgan, 91 pts.; 3, Mr. Jim Scott-Morgan, 89 pts. Fancy Goldfish, Owner Bred Pairs: 1, Mr. Coombes.

After the interval, the secretary gave members some information regarding the recent meeting of the Association of Southern Aquatic Societies. The next meeting will be held at Kinson Community Centre, Pelhams Park, Kinson, on the first Monday of the month, and anyone interested in fish keeping is warmly invited.

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MEMBERS of the **Rugby and District A.S.** recently saw a slide and tape programme presented by the B.K.A. entitled "Peat Divers". Recent table show results are as follow: Barbs: 1 and 3, K. Russell; 2, B. Woolverton. Characins: 1, R. Delday; 2, D. Green; 3, H. Harris. Breeders (Egglayers): 1, H. Harris. In the table show, Class 1 for Juniors, one exhibitor, Master Q. Wells, scored the first three places. In the second class, A.V. Pairs, the result was 1, H. Harris; 2, D. Green; 3, F. Underwood. Show Secretary, Mr. H. Harris, 45 Stephen Street, Rugby. Librarian, Mrs. J. Smith, 18 Meller Road, Rugby. Newsletter Editor, Mr. K. Russell, The Square, Stockton, Rugby. Meetings held on the first and third Mondays in the month at Northlands School, Pinders Lane, Rugby.

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AT the Final Table Show of **Brent A.S.** for the Section 1, Series 2 meeting, the results were as follow: Breeders: 1 and 2, J. Raymond; 3, R. Fox; 4, J. Reed. Coldwater: 1, B. Fellows; 2 and 3, R. Fox; 4, D. Bevan. Toothcarps: 1 and 4, P. Shrimpton; 2 and 3, R. Fox. Best in Show: B. Fellows. The Denis Smith Trophy was won by R. M. Fox with 24 points and the overall Championship position has reached an interesting stage with the leaders being T. F. Smith with 64 points, C. Swinburne 61 points, R. Fox 53 points and P. Shrimpton 39 points.

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THE annual general meeting of the **Independent A.S.** was held recently and the officers elected were as follows: F. Tomkins, President; G. Dickson, Chairman; J. Kettle, Vice-chairman; C. Pegram, Show Secretary; E. Islip, Assistant Show Secretary; T. Stevenson, Treasurer; A. Scudder, P.R.O.; Secretary, Mrs. L. H. Ratcliffe, 337, Ordnance Road, Enfield, Middlesex. Mr. E. Islip was awarded the Best Fish of the Show at the recent Tottenham Open Show. The Independent meets each Monday at 8 p.m. at The Montem School, Upper Hornsey Road, Holloway, London, N.7 and new members will always receive a warm and friendly welcome.

A BRING and Buy auction of the **Hull A.S.** was attended by fifty-two members and ten visitors at the fortnightly meeting. The Fish of the Night was Cats and Loaches and the result was 1, B. Stabler; 2, J. Mitchell; 3, T. Collingwood. Junior entries: 1, C. Burrows; 2, C. Batch. A.O.V. Class: 1, T. Douglas; 2, E. Chapman; 3, T. Collingwood. A warm welcome is extended to all visitors to this fast growing popular club.

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WITH a record number of 343 entries, the Open Show organised by the **Valley A.S.** was the most successful ever held. Award for the best fish in the show went to Mr. B. Moorcroft, from Merseyside. Mr. and Mrs. Bone, of Huddersfield, had the highest number of individual first places. Results: Guppies: 1, R. Hughes (Gorton); 2, E. Lees (Ashton); 3, Mr. Thompson (Mixenden). Platys: 1, Miss Kaye (Huddersfield); 2, Mrs. Harrop (Oxram); 3, J. T. Sutton (Oxram). Swordtails: 1, Mr. and Mrs. Bone (Huddersfield); 2, Mr. and Mrs. Grimshaw (Sunny Brow); 3, Mr. P. Woodward (Blackpool). Mollies: 1, P. Woodward (Blackpool); 2, A. E. Gardner (Heywood); 3, F. Bishton (Valley). Small Barbs: 1, 2 and 3, P. B. Gregory (Oxram). Small Characins: 1, Mrs. Harrop (Oxram); 2, P. E. Gregory (Oxram); 3, M. Jones (Valley. Dwarf Cichlids: 1, 2 and 3, A. E. Gardener (Heywood). Large Barbs: 1, Mr. Parks (Merseyside); 2, H. Page (Nelson); 3, Mr. and Mrs. Grimshaw (Sunny Brow). Large Characins: 1, J. Murray (Belle Vue); 2, Mr. White (Halifax); 3, B. Moorcroft (Merseyside). Large Cichlids: 1, B. Moorcroft (Merseyside); 2, E. Leeds (Ashton); 3, Master Thompson (Mixenden). Angels: 1, J. Williams (Oldham); 2, E. Edmunds (Salford); 3, Mr. and Mrs. Cooper (Bury). Anabantids: 1, G. Kershaw (Heywood); 2, K. Hill (Heywood); 3, A. Newall (Glossop). Fighters: 1, J. Shepherd (Salford); 2, M. Jones (Valley); 3, B. Thompson (Glossop). Rasboras: 1, P. and H. Smith (Gorton); 2, J. Roberts (Burnley); 3, F. E. Gregory (Oxram). Danios: 1, K. Hill (Heywood); 2, Mr. and Mrs. Webb (Salford); 3, Mrs. Harrop (Oxram). Toothcarps: 1, P. and H. Smith (Gorton); 2, J. Roberts (Burnley); 3, K. Hill (Heywood). Loaches: 1, W. Parkin (Huddersfield); 2, F. Mulla (Merseyside); 3, A. Quinton (Valley). Catfish: 1, R. Tompkinson (Glossop); 2, F. Mulla (Merseyside); 3, P. and H. Smith (Gorton). Labeos: 1, H. William (Valley); 2, Mr. Kirkby (Merseyside); 3, R. Hughes (Gorton). A.O.V. Tropical: 1, I. Watson (T.A.B.); 2, Mr. and Mrs. Webb (Salford); 3, Mr. K. Hill (Heywood). Fancy Goldfish: 1, S. Walsh (Accrington); 2, Mrs. K. Hill (Heywood); 3, S. Walsh (Accrington). Common Goldfish: 1 and 3, Mrs. Davies (Heywood); 2, Mr. and Mrs. Cooper (Bury). A.O.V. Coldwater: 1 and 3, Mrs. Davies (Heywood); 2, A. Kaye (Huddersfield). Pairs Egglayers: 1, P. E. Gregory (Oxram); 2 and 3, Mr. Kirkby (Merseyside). Breeder's Livebearers: 1, Mr. and Mrs. Bone (Huddersfield); 2, T. Hardman (Bury); 3, J. Shepherd (Salford). Breeder's Egglayers: 1, J. Shepherd (Salford); 2, Mr. Stroy (Halifax); 3, Mr. White (Halifax). Pairs Livebearers: 1 and 2, Mr. and Mrs. Bone (Huddersfield); 3, P. Woodward (Blackpool). Rooted Plants: 1, T. Hardman (Bury); 2, K. Hill (Heywood); 3, Mr. and Mrs. Ellis (Valley). Cutting Plants: 1 and 2, T. Hardman (Bury); 3, Mr. and Mrs. Ellis (Valley). Furnished Jars: 1, 2 and 3, Shields (Halifax).

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THE following is a report of the **Mid-Herts A.S.** activities for April. There was to be a talk on Genetics but unfortunately the speaker did not come. The table show results were: Cichlids: 1, R. Savage (Angel); 2, R. Davison (B. Accara); 3, P. Barnard (T. Mozambique). 4. A. Withers (C. Nigrofasciatum). D. Cichlids 1, P. Barnard (Nribensis); 2, A. Withers (O. Chromide); 3, A. Withers (P. Arnoldi); 4, B. Rumney (O. Chromide). Fighters: 1, T. Summers; 2, C. Withers; 3, T. Summers.

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THE April issue of "Lateral Lines" the journal of the **York and District A.S.** once again contains a number of bright features devoted to various phases of the "hobby." At the March meeting fifty-nine members were present and the main item was a set of slides entitled "Tropical Marines."

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THE **Blackwater A.S.** enjoyed a slide show of the 1967 British Aquarist show at the April meeting. Members were also informed that St. Peter's Hospital at Maldon have accepted the offer of a furnished tank to be placed in the old folk's rest room. The chairman of the club is negotiating for a suitable tank.

The table show had a great deal of support and two classes were presented, one for Barbs and the other for coldwater. Results—Barbs: 1, Master S. Kempen; 2, A. Eaton; 3, D. G. Kempen. Coldwater: 1, Mr. Crace; 2, Master J. Devall; 3, Master P. Clayton.

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THE **Chester and District A.S.** were very disappointed that their President, Mr. G. S. Mottershead of Chester Zoo, was unable to attend their Annual General Meeting, Dinner and prizegiving but they were fortunate, however, in having Mr. F. Williams, of the Zoo Aquarium, to preside over the meeting and present the trophies. The evening also included a slide show by one of the members of the entries in the furnished aquarium competition together with a selection of slides of members' fishes which was enjoyed by all.

The awards were:—The Mottershead Cup, best furnished aquarium: R. E. S. Dutton, A. Shield, second best furnished aquarium: R. Needham. The Russell Allen Cup, first breeders class: C. Boyer. The John Evans Cup, the highest number of table show awards: E. V. Stokes. The Pabo Cup: R. E. S. Dutton. At the annual general meeting the following officers were elected: Chairman: E. V. Stokes; Secretary: Mrs. A. Dutton; Treasurer: P. Tomlinson; Librarian: R. E. S. Dutton; Fish Breeding Recorder: C. Bowyer.

The Society has a full programme for the coming year; meetings are held every first and third Thursday of the month at the Oddfellows Hall, Lower Bridge Street, Chester. New members are welcome and enquiries should be made to the secretary, The Limes Farm, Tarvin, Chester.

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AT the first March meeting of **Swillington A.S.** Mr. J. Skinner gave a short talk on fish diseases and other problems connected with fishkeeping. Results of the table show was as follows: Barbs (small): 1 and 2, G. Nash; 3, J. Lindley; Novices, 1, 2 and 3, Messrs. I. and M. Linden. Mr. Nash received the Richardson Pet Shop trophy for small barbs.

The results of the second March meeting were:—Corydoras: 1, D. Newman; 2, I. and M. Linden; 3, Mrs. A. Gawthorne. A.O.V. cats and loach: 1 and 3, P. Reynolds; 2, I. and M. Linden. Mr. Newman received the W. Gawthorne trophy for Corydoras, and Mr. Reynolds received the A. Gawthorne trophy for A.O.V. cats and loach.

March was a busy month for Swillington, as the annual dinner-dance was held at Pontefract and the annual inter-society table show was held also. The nine societies invited were: Aireborough, Bradford, Dewsbury, Horsforth, Pontefract, Tadcaster, Wakefield, Whiterose and York. Results as follow: Barbs, 1, G. Nash; 2, Goodall and Piper; 3, S. Batty. Cichlids: 1, R. Taylor; 2, P. Carey; 3, P. Barritt. Anabantids: 1, P. Barritt; 2, A. Whitelock; 3, F. Gates. Characins: 1, J. Whiteley; 2, B. Shepherd, 3, Mr. and Mrs. Cohen. Fighters: 1 and 3, Mr. and Mrs. Cohen; 2, R. Taylor. Toothcarps: 1, Mr. Greenall; 2, P. Barritt; 3, J. Holmes. Cats and loach: 1, P. Carey; 2, Mr. and Mrs. Cohen; 3, Mr. Audsley. Guppies: 1 and 2, G. Thickbroom, 3, K. Marshall. Livebearers: 1, J. Whiteley; 2, B. Megson; 3, R. Lister. A.O.V. Egglayer: 1, F. Gates; 2, P. Reynolds; 3, Mr. and Mrs. Cohen. Egglayer (pairs): 1, P. Carey; 2, B. Shepherd; 3, Mr. and Mrs. Cohen. Livebearers (pairs): 1, J. Robinson; 2, R. Taylor; 3, R. Stringer. Breeders (egglayers): 1, Messrs. Goodall and Piper; 2, Mr. and Mrs. Cohen; 3, R. Stringer. Breeders (livebearers): 1, J. Robinson; 2, R. Stringer; 3, Mrs. S. Batty. J. Whiteley gained Best in Show, and Aireborough was the winning society, gaining 30 out of a total of 85 points. Pontefract came second with 25, and Swillington were third with 11.

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A MEETING of the **Mid-Sussex A.S.** was held recently when forty-six Club Members were entertained by the Hendon and District Aquatic Society via the medium of a slide show and tape recording, which gave a varied résumé of different types of Tropical and cold water fish. The slides and tapes were of excellent quality and credit must go to the time and trouble which the Hendon Club took in compiling such a wonderful programme.

At the meeting members were able to purchase several varieties of fish at reasonable prices from members who had successfully bred the fish. Mention was made by Mr. Robin Johnson (Chairman) that in future the club hopes to have a library and encouraged those present to bring books in support of this venture. Any Aquarists who have not attended any of the club meetings are cordially invited to come along when a warm welcome will be extended to all new members. The meetings are held at the "Fox and Hounds", Haywards Heath.

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THE first leg of this year's table show of the **Barry A.S.** was held recently when the following were the results: Labyrinth: 1, A. Ibbertson; 2, Mr. S. Nelson; 3 and 4, Master B. Curnow. A.O.V. Egglayer: 1, S. Nelson; 2, B. Harding; 3, A. Ibbertson; 4, P. Player. Barbs: 1 and 2, A. Ibbertson; 3, G. Tippins; 4, S. Nelson. Livebearers: 1 and 3, Mr. Kirkpatrick; 2, Mr. Harding; 4, Mr. Harding. The Annual Open Show is now to be held on 27th July at the Memorial Hall, Gladstone Road, Barry.

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THE following officers and committee were elected at the Annual General Meeting of the **Huddersfield Tropical Fish Society.** Chairman: J. Wyke; Vice-Chairman: B. Robinson; Treasurer: D. Brown; Show Secretary: E. Kaye; Secretary: Mrs. M. Bone, 1 Bradshaw Drive, Honley, Nr. Holmfirth. Committee: Mr. Blamires and Mrs. C. Milnes. The meetings are held fortnightly at the New North Road Baptist School, when old and new members will be welcome.

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THE members of the **Gosport and District A.S.** were hosts to Portsmouth, Winchester and Southampton aquarist societies for an inter-club table show, the classes being a.v. characin and a.v. catfish. This competition was won by the Gosport society, during the same evening a slide show was presented with tape commentary entitled "The American Scene."

The results of the recently held Home Furnished Aquaria competition were: 1, K. Clough; 2, and 3, Master I. Perman. New members will be welcome, for further details please contact Mrs. J. Wright (Secretary), 50, Prideaux Brune Avenue, Bridgemary, Gosport, Hants.

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A NEWLY formed section of the **Fancy Guppy Association** held their first meeting in Birmingham recently. Twenty-two members and visitors were present and 118 entries were benched for the table show. During the judging the meeting discussed F.C.A. practices and rules. Monthly meetings will be held on the fourth Sunday of each month at the Glebe Farm Community Centre, Glebe Farm Road, Stetchford. This is approximately one mile to the N.W. of Elmdon Airport. The meetings will commence at 2.30 p.m. and a full table show for guppies will be available. The officials of the Association are: Chairman: S. Croft, Esq. Secretary: M. H. Delingpole, Esq., Fairfield, Radford Road, Alvechurch. Show Secretary: P. Jinks, Esq., 355 Stockfield Road, Yardley, Birmingham.

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AT the April meeting of the **Llantwit Major A.S.** Mr. D. Songhurst presided. He welcomed the members, also Messrs. A. Lewis and P. Gordon as new members. The result of the evening's table show was as follows. A.V. Livebearers: 1, A. Rogers; 2, 3 and 4, A. Ibbertson. A.V. Egglayers: 1 and 4, D. Songhurst; 2, A. Ibbertson; 3, A. Rogers. The chairman thanked Mr. James for his services as judge. The raffle prize was won by Mr. Gordon.

THE feature article in the **Wellingborough and District A.S.** monthly newsletter for April is devoted to the Guppy. Other smaller contributions go to making this quite a bright monthly issue. The secretary of this society is D. R. Lawrence, 85, Albert Road, Wellingborough.

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AT the well-attended Annual General Meeting of the **Uxbridge and District A.S.** members heard both chairman and secretary speak on the highly successful past year which had been enjoyed. Membership numbers had remained high and the club had done well in open competition. The treasurer reported also that the financial position was sound. Plans for this year were announced and these consist of a number of table shows, an outing and inter-club shows. The club open show will be held on Saturday, 22nd June, at the Meadow School, Royal Lane, Hillingdon, Uxbridge; full details being available from the show secretary, N. V. Lee, 46 Airedale Road, Ealing, London, W.5. It would be appreciated if show secretaries in and around the London area would kindly forward schedules, half a dozen will suffice, to the show secretary to enable Uxbridge to support their open shows. Club officials for this year are as follow: Chairman: P. Ginger; Secretary: R. Forder; Treasurer: J. Peters. Thanks go to the retiring chairman, R. Moore, for his good work for the club in the past.

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AT the first April meeting of the **Loughborough and District A.S.** thirty members attended and the highlight of the evening was a quiz organised by two of the club members. Result of the table show for pairs was 1, C. Roberts (red-tailed black shark); 2, I. Purdy (Pristella Riddlei); 3, Mr. and Mrs. Howard (Rosy Barbs).

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SECRETARY CHANGES

Chester and District A.S. Mrs. A. Dutton, The Limes Farm, Tarvin, Chester.

Stretford and District A.S. B. Ogden, 107, Crofts Bank Road, Davyhulme, Urmston, Manchester.

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CHANGE OF ADDRESS

A CHANGE of address is notified by the **Harlow A.S.** secretary. The new particulars are Mr. J. Duncan, 113, Little Pynchons, Harlow.

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NEW SOCIETIES

THE new **Rochdale and District A.S.** has been formed and the first meeting was held at the Bridge Inn, Bury Road, Rochdale, in early April. All future meetings will be held fortnightly. The Club was formed with nineteen members and new members will be welcome.

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A NEW society has been formed at Sunderland and will be known as the **Sunderland A.S.** The officials elected were chairman A. Bailey. Secretary T. W. Anderson. Treasurer G. Pickersgill. Would any aquarists who are interested please contact the Secretary at the following address: T. W. Anderson, 4, Amalfi Square, Gilley Law, Sunderland.

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THE inaugural meeting of the **Tonbridge and District A.S.** was held on 3rd April when the following committee was elected. Chairman: L. Hill; Vice-chairman, D. Allin; Treasurer, R. Baker; Show and Social Secretary: M. Bailey; Secretary: I. T. Matheson, 33 Nortons Way, Five Oak Green, Nr. Tonbridge. Members, C. Bruning, J. E. Bellingham, J. Williams. Meetings will be held on the second Wednesday of every month at 8 p.m. in Dalgare Hall, Tonbridge and new members will be welcome.

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THE **Peterborough Fishkeepers** were formed as a society on the 7th May. At the inaugural meeting the number present was nineteen and future meetings will be held on the first Tuesday of the month. The venue has to be decided. The secretary is Roy Scott, 58, Thorpe Lea Road, Peterborough, Tel. 3679.

We regret that due to extreme pressure on space the Show Reports of **Osram A.S.** and **Pontefract A.S.** have not been included in this month's issue. They will appear next time with other notes which have been omitted.

AQUARIST CALENDAR

2nd June: Barnoldswick, Earby and District A.S. Open Show at the Ambulance Hall, New Road, Earby. Details now ready from J. Wiseman, Secretary, 10, Dickens Avenue, Barnoldswick, nr. Colne, Lancs.

8th June: Catford A.S. Open Show. Particulars may be obtained from Mr. K. Owen, 196, Langley Way, West Wickham, Kent.

8th June: Llanrwit Major A.S. Annual Open Show. Details available from Show Secretary, J. Sunders, 26 Sandfield Road, Aberrendig, Bridgend, Glam.

8th June: Southampton and District A.S. Open Show at St. Deny's Hall, Southampton. Hon. Show Secretary, Mr. D. A. Gibbs, 57, Wavell Road, Bitterne Lodge, Southampton.

9th June: Thorne A.S. Open Show in Thorne Grammar School. Details from T. Dickens, 29, Northeastern Road, Thorne, nr. Doncaster.

9th June: Loughborough A.S. Open Table Show, "Stoker House", Bedford Square, Loughborough. Schedules from K. Tiller, 9, Lowswater Drive, Loughborough.

15th June: Bracknell and District A.S. (hosts), Three Counties Annual Open Show, Victoria Hall, Bracknell. Show Secretary, Mr. K. Phillips, 40 Pondmoor Road, Bracknell, Berks.

15th June: Yeovil and District A.S. First Open Show at Grass Royal School, Yeovil. Details from Show Secretary, Mrs. T. Gillard. 42, Crofton Ave., Yeovil.

16th June: Brighton and Southern A.S. Annual Open Show, Marmion Centre, Marmion Road, Hove. Show Schedules are available from R. Browning, 34, Rowan Close, Portslade, Sussex.

16th June: Lytham A.S. Annual Open Show to be held at Lowther Pavilion, Lowther Gardens, Lytham, Lancs.

16th June: Swillington A.S. Open Show, Swillington Primary School, Swillington.

16th June: Creswell and District A.S. Open Show at the Drill Hall, Elmton Road, Creswell. Show Secretary, R. Harper, 60, Rogers Avenue, Creswell, Worksop.

23rd June: Leamington and District A.S. Third Annual Open Show at Trinity Hall, Trinity Street, Leamington Spa, Warwicks. Schedules from Show Secretary, Mr. Bishop, 15, Wellington Road, Leamington.

23rd June: The Tyneside Aquarists' Open Show, Central Hall, Gosforth. Schedules are available from R. Skoyles, 189, Fossway, Walkergate, Newcastle-upon-Tyne, 6.

23rd June: Alfreton and District A.S. Annual Open Show. George Hotel, Chesterfield Road, Alfreton. Schedules may be obtained from Mr. S. Hill, Show Secretary, 35, South Street, Riddings, Derbyshire.

23rd June: Bradford and District A.S. Open Show at the Textile Hall, Bradford.

23rd June: Cambridge & District A.S. Open Show at the Guildhall, Cambridge.

23rd June: Salisbury and District A.S. Annual Open Show.

27th-29th June: Bristol Tropical Fish Club Open Show, Newton Street, Congregational Church Hall. Schedules from Mr. W. Holland, 47, Woodland Road, Nailsea, nr. Bristol.

30th June: Skipton and District A.S. Open Show at Ambulance Hall, Skipton.

7th July: Tadcaster and District A.S. Open Table Show at the Roman Catholic School, St. Joseph's Street, Tadcaster. Details from R. M. Fairclife, Stutton Grove Lodge, Stutton Grove, Tadcaster.

7th July: Cheltenham & District A.S. Annual Open Show, Ambulance Headquarters Hall, 86, Gloucester Road, Cheltenham.

13th July: Basingstoke and District A.S. Annual Open Show at the Carnival Hall, Basingstoke. Schedules from A. Marshall, 61, Pitman Close, Basingstoke.

13th-14th July: Romford and Beacontree A.S., Dagenham Town Hall. All enquiries to Mr. J. M. R. Fyne, 3, Ashvale Drive, Granham, Essex. Phone: Upminster 28435.

14th July: Medway A.S. Second Open Show at St. John Fisher School, Chatham. Secretary, Mr. K. Brown, 5 Allison Avenue, Gillingham, Kent.

14th July: Bournemouth Aquarist Club Annual Open Show at Kinson Community Centre, Pelham Park, Kinson. Show schedules and entry forms available after 1st May from Show Secretary, Mr. J. V. Jeffery, 30 Braemar Avenue, Southbourne, Bournemouth.

21st July: Cleveland A.S. Open Show. Particulars obtainable from J. W. Haley, 51, Westminster Close, Eston, Middlesbrough.

27th July: Croydon A.S. Open Show to be held at the Stanley Halls, South Norwood, London, S.E.25. Further information may be obtained from the Secretary, Mr. D. H. Crowley, 180 Harrington Road, South Norwood, S.E.25.

3rd.-10th August: Portsmouth A.S. Open Show at the Portsmouth Community Centre, Twyford Avenue. Schedules available from Mr. W. Ryder, Show Secretary, 493 Commercial Road, Portsmouth.

11th August: Rainworth and District A.S. Open Show at the Showroom of E. Taylor and Sons (Southwell) Ltd., West End Garage, Southwell, Notts. Hon. Secretary, Mr. K. Clifford, North Stoke, 45a, Linden Street, Mansfield.

14th-17th August: Midland Aquarium and Pool Society Annual Open Show, Bingley Hall, Birmingham.

31st August-1st September: Harlow A.S. Open Show.

7th September: High Wycombe A.S.

7th September: Yate and District A.S. Annual Open Show at Christchurch School, North Street, Downend, Bristol. Schedules from Mr. T. J. Green, 42A, North Street, Downend, Bristol.

7th September: Bethnal Green A.S. Annual Open Show at the Bethnal Green Evening Institute. More details will be available later.

7th-8th September: Nottingham and District Open Show. Details later.

7th-8th September: Roehampton A.S. First Open Show in conjunction with Wandsworth Borough Council.

8th September: Warrington A.S. First Open Show.

14th September: Hounslow and District A.S. Annual Open Show at the Youth Centre, Cecil Road, Hounslow.

15th September: Reigate and Redhill A.S. Provisional date, venue to be fixed. Show Secretary, Mr. I. Stamp, 10, Benhams Drive, Horley.

21st September: Amersham and District A.S. Annual Open Show. Secretary, Mrs. Veronica Keating, 62, Townsend Road, Chesham, Bucks.

21st September: Newport A.S. Sixth Annual Open Show at the Duffryn Junior High School, Snow Hill, Newport. Details from the show secretary, Mr. M. J. Parry, 45, Western Drive, Gabalfa, Cardiff.

21st September: Mid-Herts A.S. Open Show at St. Paul's Church Hall, St. Albans, Herts. Show schedules are available from C. Withers, 15, Charmouth Road, St. Albans, Herts.

29th September: Annual Open Show at Harrowside Solarium, South Promenade, Blackpool.

29th September: Hucknall and Bulwell A.S. Annual Open Show. Works Canteen, A. R. Marshall and Sons Ltd., Forest House, Hucknall Lane, Bulwell, Notts. Show schedules from M. T. Harrington, 5, Greenwood Vale, Hucknall

26th-27th October: British Aquarists' Festival Belle Vue, Manchester.