

Water Life

AND AQUARIA WORLD



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FRONT COVER: A GROUP OF CHARACINS.
Top left, two Beacon Fish (*Homigrammus aellifer*);
top right, two Penguin Fish (*Thayeria obliqua*); centre
left, pair of X-ray Fish (*Pristella riddellii*); centre right,
two Black-line Tetras (*Hyphessobrycon scholandi*);
bottom left, two Neonostomus trifasciatus; bottom
right, male specimen of a *Nannostomus* species.

Photograph

[G. J. M. Timmerman

EDITORIAL

Comparison

FOR three days—December 6th, 7th and 8th—in the National Hall, Olympia, London, the National Exhibition of Cage Birds and Aquaria will give aquarists and birdkeepers and others, the opportunity to see birds and fish from leading exhibitors in this country. The exhibits compete for awards under conditions which ensure that each entry is of high quality.

Aquarists, especially, will want to visit the event for they will be given a chance to see an aquaria exhibition which breaks new ground. A self-contained section, the Aquaria display, is, in effect, three distinct shows. There are the classes promoted by WATER LIFE with the support of the Federation of British Aquatic Societies, and, in addition, the two annual shows of the Goldfish Society of Great Britain and the Guppy Breeders' Society.

Different Judging Standards

It will be the first time that exhibitors will be able to assess the respective merits of the F.B.A.S. Goldfish Standards with those of the G.S.G.B. The latter's four basic varieties and exclusive method of pointing are well known to members, but are not so familiar to those outside that society's ranks. Comparison between the methods of judging, too, will prove of considerable interest for, whereas the awards in the WATER LIFE classes will be placed by two recognised judges appointed for each class, the G.S.G.B. entries will earn their awards, as specimen Singletails, Twintails, Globe-eyes, or Brambleheads, by the averaging of points given by a panel of judges drawn from members.

The Guppy Breeders' Society are appointing judges from amongst those accepted as competent and these will be pointing the exhibits under the society's revised scale of points. All who have bred and exhibited varieties of the popular *Lebistes* will be able to see how these new scales work in selecting the best of the fish in competition.

Championship Classes

In the WATER LIFE classification is included, for the first time, a championship section which, it is believed, will bring about keen competition between individual aquarists who are nominated by clubs. The introduction of this section is in the nature of an experiment and the hobby has been presented with an innovation which gives both exhibitors the means of gaining distinction as owners of the best championship fish of their kind and the nominating clubs diplomats to record the fact that it is from their ranks the owners of the leading fish come.

Once again clubs will be vying with each other for the honour of setting up the best furnished aquaria. Individual exhibitors who have bred their own fish are being encouraged by a larger section than hitherto for breeders' teams, consisting of six young fish of a kind which have been produced in their own aquariums. Knowledgeable visitors to the show, which is in aid of charities, will want to compare the different methods employed to pick out the fish deemed worthy of an award.

Fighters to the End

Story of Two *Betta splendens*'
Commando Tenacity

By Richard G. Elms

TO enthusiasts, the species commonly called the Fighting Fish, is known as *Betta splendens*. I am an enthusiast but the two I have in mind will always be known as "Betta commandos" for theirs is a story of toughness.

A friend, wishing to repay a small kindness, undertook, quite voluntarily, to bring me some *Betta splendens* from the Far East. The friend is with the B.O.A.C. He had no knowledge of tropicals, and did not warn me of his intentions.

Whilst in Bangkok he bought eight young specimens in a "Goldfish" bowl for the equivalent of five shillings. He then started to ponder as to how many would survive the journey home, via Hongkong, Saigon, Singapore, Colombo, Bombay, Bahrein, Cairo, Rome and London, bearing in mind the changes in climate they would have to endure and the fact that he had no special apparatus for them.

The first part of the journey was uneventful for the fish. Considerable amusement was caused, however, among the native "boys", as my B.O.A.C. friend stepped off the massive aircraft, made his way through the Customs, carrying in one hand a briefcase and in the other the "Goldfish" bowl suspended on string.

The fish took well to flying and appeared composed at 15,000 feet. On board they were kept on a shelf of a cupboard in the steward's galley, wedged, to stop sliding when the plane was climbing or descending.

The First Misfortune

On the third day of their journey, while flying between Singapore and Colombo, the bowl was brought out for a sunning. The flight was smooth. In the galley was the usual assortment of plates, coffee pots, bottles of sauces, etc.

Then it happened. My friend, an experienced flyer, assured me it was the biggest "bump" he had experienced. Everything in the galley went up to the ceiling. The scene was chaotic. In the middle of the mess was the fish bowl, inverted.

Fortunately the fish "keeper" was off duty and could set about salvaging the Fighters. As he put it to me later, "In such a shambles, baby tropical fish are hard to find. One by one they were spotted. They were swimming in puddles of a solution comprising fish water, washing-up water, tea, coffee, milk and even dregs of wine and spirit. Those that were not in puddles were under saucers or between knives and forks".

It took almost five minutes to reclaim six of the fish. The seventh was actually in the galley sink "swimming" in soapy water, but not in too good condition. The eighth was never seen again.

The seven survivors were put back in the unbroken bowl which was filled from the drinking water supply. This water is heavily chlorinated in aircraft flying in the Far East, but in a surprisingly short while the fish were quite perky.

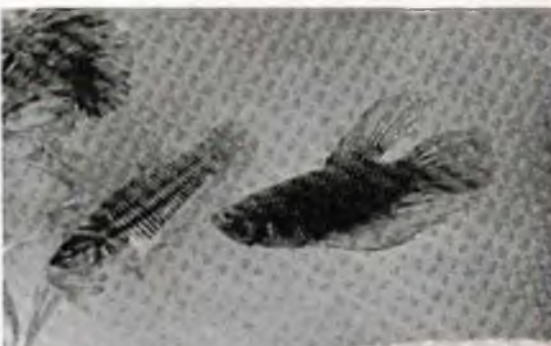
Bahrein was reached without further incident. As the air crew are changed here, my friend prepared to carry his precious cargo to the Crew Rest House, for a two-day stop. Bahrein is a hot and dry spot. Sitting in the crew jeep as it bumped its way from the airport, my friend did a juggling act with the bowl on string. But it wasn't to be. There was a crash of glass and he was left sitting in the dark, holding a piece of string.

By the faint gleam of a hand torch, there on the hot, sandy, floor of the jeep were a number of rapidly disappearing pools of water, many splinters of glass and a few flapping,

sand-covered fish. The *Betta splendens* looking far from splendid. What should one do in these circumstances? My friend came to the only conclusion . . . to give up. It would take at least 15 minutes to reach the Rest House. However, on arrival there he changed his mind, rushed into the bar and rapidly demanded one empty pint glass. Said my friend "The barman understandably looked horror stricken, for always in the past have I called for full pint glasses". Grabbing the empty glass without more ado, he dashed into the toilet and drew some water. Then he remembered that water in Bahrein is terribly brackish; you cannot even raise a shaving lather. Back he went into the bar and had a quick word with the manager, explaining the emergency and asked for sweet (distilled) water, kept for drinking. The manager was sorry. Not a drop was left in the place. So out went my friend to the jeep with the brackish stuff.

There by torchlight were seen seven fish covered in sand and practically dry. One by one they were dropped into the pint glass and taken indoors. Two of the fish began to recover. The other five were lying on the bottom. Realising they had little chance in that brackish water, my friend embarked on a "sweet water" hunt. A supply was located two miles away, after a car ride to someone's flat. On arrival, five fish were still alive, but only just. My friend, helped by the "sweet water" owner, spent the next fifteen minutes shaking glasses of distilled water, like two demoniacal barmen mixing cocktails for Bacchus himself, in order to help aeration.

Whilst sleeping, the pint glass of fish was placed on the ledge above his bed. He was awakened next morning by



Photograph:

(G. J. M. Zimmerman)

A pair of Siamese Fighting Fish (*Betta splendens*). Their finnage closely resembles that found in wild specimens.

feeling a cold fish on his face. Apparently the Fighters had recovered sufficiently to start sparring among themselves in the pint-capacity aquarium, and one had decided to jump for it. Segregation was the only solution. Half pint glasses were obtained and the aggressors shifted.

When my friend left Bahrein, only three fish were left. They had been fighting all the time. Two had jumped for their lives and lost them on the carpet while my friend was out and so met cowardly deaths.

The rest of the journey to London was made, by the remaining fish, in a jam jar. They stood the uneven temperature well. No heating arrangements were available, apart from the aircraft's normal system. Even at ports of call they had to brave the outside chills or heat. On arrival in London they spent one more night with their protector before being handed to me. But one failed on the last lap. It decided that life in London was too monotonous and jumped for it, to die in a suburban house after surviving the hazards of that epic 10,000 mile journey.

The two that came into my possession proved to be a pair and the pride of my show tank. Splendidly done, you "Betta commandos"!

Spawning Siamese Fighting Fish

Preparing the Aquarium—Separating Parent Fish—
Fertilization—Care of Eggs and Young—Suitable Foods

By Rev. W. E. Beale

WHEN setting up the aquarium in preparation for the spawning it is most important that everything is as near correct as possible. Into the tank (which should not be less than 24 x 12 in.) put well-seasoned water to a depth of 6 in. Water from an established tank will do. The usual compost should be placed on the bottom and a good supply of plants introduced. Place a partition of glass down the middle of the tank. Adjust the thermostat so that the temperature is between 78-80 deg. F. and over the tank place a piece of glass. A thin strip of this should be cut the whole tank length so that it only may be raised at feeding time. The less amount of cold air reaching the water surface the better as the youngsters will not take kindly to a sudden rush of cold air. At one corner of the top glass it is wise to cut a further small piece away so that the male may be fed whilst he is looking after the nest. Over the whole of this place a swivel-type lamp of 60 watts should be put. This type of lighting is most helpful as when feeding tiny food to the baby fish the light can be directed right on top of the food. After allowing 24 hours for the water etc. to settle down place the male and female in their separate compartments.

Display During Isolation

Almost at once the male will try to make up to the female and both will spread their fins. They cannot reach each other which will tend to excite the male even further. Now and again the female will appear to get a little tired of the notice taken of her and will retire behind a thick growth of plants. It will not be long before she is back again looking at her future mate through the glass. After a while—perhaps two days—the male will start to build a bubble-nest. I have noticed that bubble-nest builders tend to build their nest on the right-hand side of the aquarium even if there is no partition. I wonder whether others have noticed this!

As soon as the male starts to build a bubble-nest the partition should be taken away and with its removal the testing time will come. The male will be unresting in making a good home for his family and every so often will chase the female over to the nest, apparently intending her to look at his



Male *Betta splendens* turning eggs in the bubble-nest. He stares for the eggs and the fry prior to their becoming free-swimming. The author recommends removing him three days later.



[Photographs]

[Wilhelm Hoppe]

The embrace of a pair of Siamese Fighters below the bubble-nest. It is at this time that eggs are laid and fertilised.

handiwork. If she is not satisfied, as is so often the case, she will swim away and take cover in the thick plants where it will not be easy for him to bully her or nip her fins.

However, if all goes well she will eventually be led to the nest where the mating takes place. The male gently but firmly embraces the female who drops her tiny eggs. These are fertilized by the male who will gather them in his large mouth and blow them into the bubbles where they will be trapped until such time as the fry are free swimming. This spawning process may go on for about two hours and if you are at home when it occurs you cannot fail to be amazed at this wonderful display of Nature. At the end of it all, the female is chased away and she must be taken out at once otherwise she may be killed by her mate.

From now on the male takes over and will guard the home against any intruders. The eggs are held in the nest by the action of the bubbles until such time as hatching occurs. The incubation period is quite short and the newly-hatched fry may be seen after 36 hours. They find shelter amongst the bubbles and the vigilant father, who very rarely leaves the nest, will keep an eye on them. If any should fall out of the nest he will catch them in his mouth and blow them back again. During this period I have found it useful to feed the adult male through the small hole made in the glass. If chopped-up small worms are carefully dropped near to him he will pick them up quickly and will get quite used to having his food dropped there. The male should not be taken away after spawning as it appears that his presence is necessary for the proper development of the eggs. He "mouths" them by taking them out of bubbles and blowing them back again and it would appear that this gives the eggs some kind of aeration. It is perhaps best to let him look after the young fish for about three days after they are free-swimming.

Initial Food for the Young Fish

After the youngsters have absorbed their yolk sacs they are ever on the look-out for food and since they are one of the smallest of the egg-layers they need plenty of Infusoria. As soon as the eggs have been laid I find it a good plan to put some dried lettuce leaves on the surface of the water

(Continued on page 300.)

European and American Salamanders

Reputed to be Omens of Evil, these Creatures
Actually Make Attractive and Harmless Pets

By Alfred Leutscher, B.Sc.

(Illustrations by L. E. Day, F.R.P.S., A.I.B.P.)

I REMEMBER the first time I ever saw a living salamander. Until it moved I was at first inclined to believe that I was looking at a small china ornament, brilliantly painted in a coat of glossy yellow and black. Was this the notorious animal I had read about, which could live in fire, which was poisonous to the touch and was an omen of death even to those upon? The lustrous black eyes which gazed mildly at me through the pet-shop window seemed to belie this evil reputation.

This species is called the Fire Salamander in Germany where it is quite common and country people still believe in its death-dealing powers. I have seen it quite frequently up in the Hartz Mountains which is the homeland of Germany's Father Christmas. This is a district of mountains, fir trees, picturesque costumes and houses which give a medieval atmosphere quite in keeping with this legendary creature.

Possible Origin of the Myth

The possible explanation for this strange belief in the salamander's fire-resisting powers may be due to its habits. It retires from view during daylight by hiding in undergrowth, under rocks and stones, or in holes in fallen timber. Logs collected as firewood sometimes contain a hidden salamander, and when the wood is placed on the fire one cannot blame the little animal wanting to crawl away from the sudden heat. Its presence in the flames, which are certain to consume it, would be sufficient to strengthen the legend.

Slow-moving and harmless, there is yet something about its brilliant colours which give the salamander a dangerous appearance. Actually, the only risk occurs when an enemy picks it up in the mouth, as happens when an attack is made. When the salamander's skin is irritated a poisonous fluid is secreted which is highly unpleasant to the taste, and most enemies will immediately release it. The poison is sufficient to kill a mouse if artificially injected.

The amphibian, the European or Spotted Salamander (*Salamandra salamandra*), has a wide distribution in Europe and has been split into a number of races according to locality. Those I saw in Germany were mostly of the spotted kind, many with yellow as the dominant colour. Others, as found in France, may have the yellow patches or stripes reduced to round spots where black is the main background.

The European Salamander is terrestrial, rarely entering water in which it is a poor swimmer, except to produce young. It is slow and deliberate in movement, lives in seclusion and, when exposed, is given immunity from attack by its bright coat. Naturalists call this pattern the warning colours of Nature. The wasp also has them. After dark or rain comes in search of prey, such

as slugs. Earthworms and slow-moving insects, grabbing these in its mouth and sometimes shooting out its short tongue after the fashion of a frog.

Mating is a clumsy, though lively, affair. The male, which is recognised by a more swollen area around the cloaca, pursues a mate and attempts to clamber on to her back. There is no actual embrace and sometimes the female in her struggles to resist his advance will throw him off. After such preliminaries the male deposits a spermatophore on the ground nearby. I have seen these objects in my salamander case. They are small, cone-shaped and gelatinous in texture, each containing a mass of spermatozoa. A female will cover one and apply it to her cloaca, so that the active sperms ascend into her body.



Underwater picture of a European Salamander larva (*Salamandra salamandra*).

Birth of the Tadpoles

No eggs are laid, and at the time of birth the mother enters water of a pool or stream. Here she rests, half in and half out, in the attitude of taking a hip bath. At intervals the gilled young, which are not unlike sturdily built newt tadpoles, are born. Some may still be enclosed in their transparent envelopes. Soon they are clear of these and spend the time resting in shallow water, snapping at small water life as it comes within range. In captivity they will grow well on *Daphnia*, *Enchytraeus* and *Tubifex*. At first they are dull in colour, the bright pattern of the parents

only appearing at metamorphosis, which occurs about three months afterwards. The baby salamanders which I have successfully bred this summer are now five months old, about three inches long, and perfect miniatures of their mother.

Breeding habits in Nature are not fully known, but most young seem to appear in late spring and summer. In captivity they may arrive in any month (a friend's salamander once gave birth on Christmas Day). The families can arrive in embarrassing numbers, about 30 is an average, but up to 60 is not uncommon with a full-sized adult of about seven inches. A remarkable



The largely terrestrial European Spotted Salamander (*Salamandra salamandra*) of which there are a number of races.

instance of a salamander breeding has been recorded when two families were produced by the same mother with an interval of two years in between. This must have occurred from one mating before the female was acquired, since the owner kept it apart the whole time.

The other European species is called the Alpine Salamander (*S. atra*). This is confined to the mountain ranges of the alpine countries and Albania, at altitudes between 800-3,000 metres. It is a smaller, more slender species, about five inches when adult, entirely black and even more strictly terrestrial than *S. salamandra*. Normally only two young are born at a time, and these are fully developed at birth, having already grown their lungs. Actually, there are many more conceived as embryos, but they are sacrificed as food to the twins which, in fact, behave as parasites within the mother's body.

These two species of salamander are cousins of our British newts, belonging to the same Family, the *Salamandridae*. The term salamander, however, has travelled



The American Spotted Salamander (*Ambystoma maculatum*). Yellow spots in two rows are present on a blue-black back ground.

abroad with the English speaking language, and is now applied to a number of other species. The largest, the Giant Salamander (*Megalobatrachus maximus*), is found in the hill streams of China and Japan. It can grow to five feet and is caught and sold as an article of food. Salamander-like monsters, which lived in the distant days of the Carboniferous Period over 200 million years ago, grew up to ten feet.

North America is the main home of modern salamanders. One of the largest Families is called the *Ambystomidae*, or Blunt-mouthed Salamanders, to which belongs the famous Axolotl and its adult form, the Mexican Salamander

(*Siredon mexicana*). An account of this species recently appeared in these pages (WATER LIFE, Vol. 5, No. 5). The Family has, in all, about 15 species in N. America, of which two have lately been added to my collection. The friend who sent them over says they are common in the damp woodlands around his home in New York State. One is called the Spotted Salamander (*Ambystoma maculatum*). It is about six inches long, and not very unlike our European Salamander. The upper half of the body is a deep, bluish-black, and the lower half and undersurface of the limbs, a pale slate colour. Round, yellow spots occur in two, more or less regular, rows down each side of the back. The other, Jefferson's Salamander (*A. jeffersonianum*), is about the same length but more slender. On the sides of its blackish body can be seen faint bluish markings.

These two species differ from the European salamanders as being entirely aquatic during the spring breeding period. In March or April they make for pools and shallows in a similar way to British newts. The males court the females and spermatophores are deposited. Later, eggs are laid, not in the way newts do it, i.e. by pressing an egg to the leaf of a water plant, but in small clumps of spawn after the fashion of frogs. Each spawn-mass may contain from 20-50 eggs. In all, from 100-200 eggs are produced. The gilled larvae develop and feed in a similar way to newts, and leave the water at metamorphosis, about three months after hatching.

At breeding time the Spotted Salamander may resort to a massed display of courtship, called the "nuptial dance". In a letter to me my American friend writes: "The night we collected the *Ambystoma* for you we observed a 'nuptial dance' of *Ambystoma maculatum*. About 60 individuals were in an area of shallow water about two feet square. They writhed and tumbled about one another until the water fairly boiled. They came up often for gulps of air. The males were actively engaged in the deposition of spermatophores. This phenomenon is quite well known but not often observed". These newcomers to my collection were at first shy and retiring, but now come out in the evening to feed readily on slugs, small worms and pieces of raw meat. By transferring them to water next year I hope to achieve success in breeding them.

The largest Family of salamanders is called the *Plethodontidae* or Lungless Salamanders. These are small and slender, devoid of lungs and usually without gills when adult, respiring through the moist skin. Some enter water to lay their eggs and others deposit them in cavities in the ground, or in hollow tree trunks. Over 50 species are known in N. America, which goes to indicate what a paradise this great continent must be for the salamander lover.

Salamanders are fascinating little creatures to study, and give little trouble in captivity. They are long lived, and I recently heard of a case of a European Salamander which has been kept in this country as a pet for 25 years.

Spawning Siamese Fighting Fish

(Continued from page 297.)

at the end of the tank farthest away from the nest. By the time the babies are free-swimming the lettuce will have created a certain amount of Infusoria. Apart from this, cultures should be prepared well before the mating takes place. Old banana skins, potatoes or dried lettuce will do or Infusoria cultures may be purchased from one of the well-known dealers. I do not care for the drip-feeding method. I much prefer to have the culture in jam-jars and, having brought the temperature up to the same as that of the water in the tank, by placing the jar in a bowl of warm water, I pour the contents into the tank. This can of course be overdone but if discretion is used I find it much the better way. I have found that with this method I can give the fry Mikro-worms even during the first week.

I use soup plates for the culture of Mikro-worms and if pieces of wood about an inch thick and 1½ in. wide are

placed in the culture the worms will make their way up the sides of the wood. On the top of these large pieces of wood are placed about six wooden match sticks. These become covered with worms which can be fed directly into the tank. If about six or more plates are used Mikro-worms can be given at least four times a day. As the water in the tank is still only about six inches deep I find that the plants are an added benefit inasmuch as they stop the worms from sinking to the bottom too quickly. The fish can the more easily find them if the wavel lamp is directed over where the worms are introduced.

In the second week I feed Brine Shrimps and I find the best method of hatching these is in shallow glass dishes. The larger the surface the better.

I should add that as soon as I have taken the adult male fish away I introduce about a dozen snails which help to clear up any waste matter including the eggs of the unhatched Brine Shrimps. At the end of a month the young fish can take mashed garden worms and dried food.

Seaside Aquarium and Reptiliary

Varied Collection of Fish and Reptiles in the Lido Aquarium and Reptile House, Margate

By C. H. W. Edmonds



Mr. Kenneth Smith handling an Australian Carpet Python and N. American Pine Snake two exhibits in the Margate Reptiliary.

Photographs by Sunbeam Photo Ltd.

A RECENT holiday on the south coast enabled me to pay a visit to the Lido Aquarium and Reptiles House at Cliftonville, Margate, where I found Mr. Kenneth Smith, who is managing the establishment during this season for Messrs. Robert Jackson Ltd. (Naturalists), of Timperley, Cheshire.

Kenneth Smith, who is a naturalist and animal collector, promptly made me feel at home and, when it was discovered that we were both members of the British Herpetological Society and very interested in fishkeeping, I was given the free run of the establishment. Within a few days I was helping him in maintaining the collection.

The exhibits consist of coldwater and tropical fish, reptiles, birds and other animals. The Aquarium is arranged behind panelling, presenting only a front view to the public. Each tank has two labels, illuminated from behind, one giving the name of the exhibit and habitat and the other, general information and habits. Each class of fish is maintained separately, making it much easier for the tyro and expert alike to identify and study any particular species. Fish which catch the eye are Albino Swords, Perma-black

Mollies, and a collection of the Cichlid family. One pair of Dwarf Cichlids were, at the time of my visit, swimming proudly with a brood of babies, and they attracted a great deal of attention. Neon Tetras are on view in good numbers, and there is also a fine shoal of Angel Fish. Some of the finest coloured Flame Fish I have seen make a beautiful picture, while Pearl, Dwarf and Croaking Gouramies, Black Widows (more fine specimens), *Barbus schuberti* and Glowlight Tetras, all combine to make a good show. There are also Siamese Fighters, Bloodfins and Sunfish, as well as the commoner tropicals.

Behind the scenes are found more tanks, for isolation and breeding. Although Mr. Smith is really too busy to do much fish breeding, he has succeeded with a few Cichlids, Mollies, Swordtails etc., but Siamese Fighters have so far refused to co-operate. He is assisted in the Aquarium by young Patrick Topham, who also finds time to collect specimens for the marine tank. Like many other public Aquariums, this one is troubled by Blue-green algae but painstaking care and attention by Patrick Topham renders this almost unnoticeable to the viewer.

Shubunkins and Hi-go provide the main coldwater exhibits and a tank of six-inch Goldfish lends itself well to the surroundings. A large Catfish is on display and, I am told, it feeds readily on whale meat and garden worms.

(Continued on next page.)



Left, the aquarium containing Black Widows at the Lido Aquarium. Right, some young Spectacled Caiman specimens wait for a meal in their enclosure. These are two very popular displays in the Lido establishment.



Two views of the second floor of the Lido Aquarium showing the arrangement and labelling of the many aquariums.

The only marine tank does not give much trouble and it has an aerator and filter working continuously. Fresh sea water is supplied frequently, the sea being so very near, and mortality is kept low. Sea Urchins, Starfish, Rock Gobies, a Blenny and two small Eels occupy the tank, but probably the most interesting inhabitant is a large and lively Three-bearded Rockling. Prawns and anemones are also included.

Tame Lungfish Exhibit

An item of considerable interest is an African Lungfish, which takes food from the hand. Its queer fins raise many excited comments and questions regarding this fish are frequent. Fire-bellied Toads and Marbled Newts are included among the exhibits, in addition to African Mud turtles and Snake-necked turtles. The Snake-necked turtles are well worth watching at feeding time, when their long necks are raised above the water to follow the feeder's hand. They occasionally snap at a careless finger!

Moving upstairs into a new wing (opened this season) which houses most of the reptiles, and some mammals, one first comes to cages containing monkeys. One is a very

cheeky Weeper Capuchin named "Bimba", and in the next cage are two Buttikofers White-nosed specimens. The monkeys cause much amusement and are firm favourites with visitors. On either side of the new hall are reptiles, including an Indian Cobra, which Mr. Smith and I had the doubtful pleasure of moving to its new quarters. African Puff Adders, American Copperheads and Kirtland's Tree Snakes comprise the list of venomous species. A fourteen-foot long Anaconda ejected parts of its last jungle meal—hundreds of Tree Porcupine quills—soon after arrival. The Emerald Tree Boa makes a beautiful splash of green amid brown branches and a group of Pythons form a nice colour pattern in adjoining cages. These are Carpet, Diamond, Royal and African Pythons, Australian Blue-tongued and Stump-tailed Skinks, Asiatic or Schlegel's Gharials and a Nile crocodile are on show in natural surroundings, while at the extreme end of the new wing the Spectacled Caimans enjoy a spacious and well built beach and pool.

A great attraction to visitors is a Himalayan Panda, not to be confused with the Giant Panda, by the way. Near the Panda are several Palm Civets, Mongooses, and a large Porcupine. Sometimes one hears above the chatter of the monkeys, the shrill cry of the parrots, and the raucous noise of a Band Aracati, a member of the Toucan family.

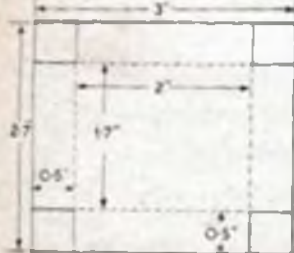
Mr. Smith was hoping to be off to the tropics again before the end of the year to bring back more rare and interesting animals. He is hoping to collect rare fish that he believes exist in areas of Guiana which have seldom been penetrated.

I thoroughly enjoyed my experiences at the Margate Lido establishment, and feel sure that other aquarists visiting the resort will find much to interest them in this well-managed Aquarium and Reptile House.

Readers' Hints and Tips

(24) Home-made Worm Chopper

TO make this device cut a rectangular piece of tin by means of scissors to a size of 3 in. x 2.7 in. Shorten the length and breadth at the four corners by cutting out square pieces 0.5 in. x 0.5 in., as shown in the illustration. Then bend the tin along the lines shown by the dotted lines and turn the edges at right-angles so that the whole is then in the form of an open box. Paper may be gummed at the four corners so that the edges are closed. The box is then filled with pitch, previously heated so that it is viscous. Nine old safety-razor blades, with their sharp edges uppermost, are



(10s. 6d. is paid for all published hints and tips.)

next introduced so that they are 0.2 in. apart and are parallel with the shorter sides.

On cooling the pitch solidifies and the blades and sides of the "box" are held firmly. This gadget is excellent for cutting and shredding Earth-worms.—K. C. Joshi, B.Sc., D.Tech., India.

CHRISTMAS PRESENT SUGGESTION

ARE you wanting to buy a gift for an aquarist friend this Christmas? Nothing would be more appreciated than copies of some, or all, of the booklets in the WATER LIFE series. Modestly priced, they form a valuable addition to the library of any fishkeeper, whether a beginner or experienced fancier. Written by recognised experts in their own fields the handbooks cover a wide range of subjects. Each is profusely illustrated. The titles are "First Steps in Aquarium Keeping" (2/-), "Hardy Reptiles and Amphibians" (1/6), "Live Foods for Aquarium Fishes" (1/6), "Garden Ponds" (1/6), "Aquatic Insects" (1/6), "Marsh Gardens" (1/6), "The Goldfish" (2/-), "Tropical Fishes" (2/-), "Pond and Stream Life" (2/-)—now ready, "The Terrarium" (1/6). All prices are excluding postage. Obtainable from newsagents and booksellers, or direct from WATER LIFE, Dorset House, Stamford Street, London, S.E.1.

Diseases of Fishes

(17) Tumours, Harmless Organisms of the Skin and General Diseases of Doubtful Origin

By C. van Duijn, Jr.,

A.M.Tech.I. (Gt. Britain), F.R.M.S.

IN fish several kinds of real tumours may occur, i.e. pathological growth of a tissue. Most of them are not dangerous, but there are some forms that have a malicious character. Some cases of real carcinoma have been found.

Swellings of the thyroid can sometimes be recognised by the formation of red spots on the throat. They may be due to a lack of iodine and occur mostly in young fishes. Healing is possible by mixing some iodine with the dried food; one part of a solution of one gram of iodine and three grams of potassium iodine in 100 cu. cm. of water mixed with 2500 parts of dried food. Too much iodine is harmful.

Harmless Organisms on the Skin

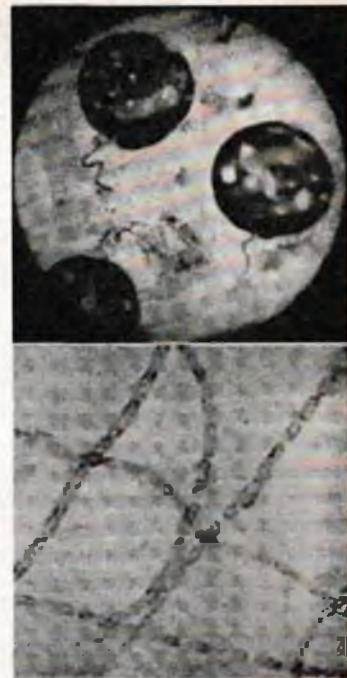
Sometimes completely harmless microscopic organisms can be found on the skin of a fish, e.g. bell animalcules (*Vorticella* and others). These are Infusorians which are highly appreciated as a food by small fry. They will settle only on fishes that are slow swimmers, such as Bettas. They do not penetrate into the skin, nor do they irritate the epidermal cells and these organisms are consequently only commensals, profiting by the good supply of fresh water, containing oxygen and food, given to them by the movement of the fish.

Obviously such a moving life has great advantages over settling on immovable objects, such as plants, stones, or the glass of an aquarium. Settling on a fish, however, can only take place under very favourable conditions, so that bell animalcules are not very often found on fishes. If there is some Fungus growth or development of bacteria on the skin, the latter will give a better hold to these Infusorians and they may therefore occasionally be found with real parasites. Then care should be taken not to confuse these harmless micro-organisms with the real cause of the disease.

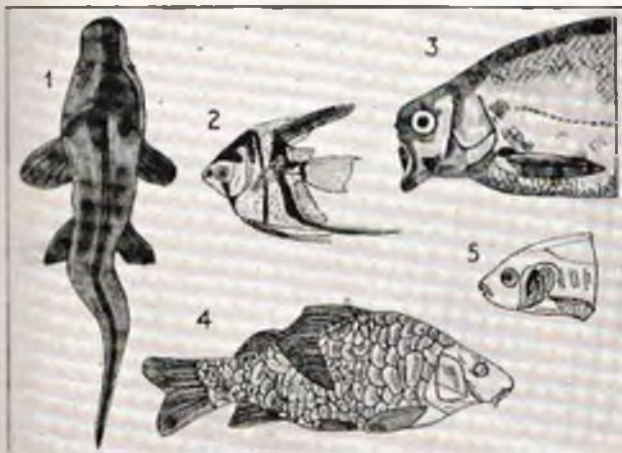
Under the microscope the bell animalcule is easily recognisable by the bell-like body, situated on a long

flexible stem, which may contract to a rolled-up spiral. The organisms are clearly visible at such low magnifications as $\times 20$, although at higher magnifications greater details of their structure will be seen. Without the aid of a microscope it is difficult to recognise a growth of these organisms. If they form large colonies, a thin veil may be seen. Some species, however, particularly those of the Genus *Carchesium*, may form such large colonies that they can be recognised with the aid of a simple magnifying glass. If no microscope is available, the easiest method of observing the tiny creatures is to introduce them (in a drop of water) on to the surface of a small plane mirror. Now let the light (from a window, or from an electric bulb) fall on one side, and observe the drop with the aid of a magnifying glass from the opposite side, thereby looking at an angle that is approximately the same as that at which the light is reflected by the mirror. By this arrangement it is possible to see particles that in other circumstances are completely invisible at the same magnification. This phenomenon is known in physics as the "Tyndall effect".

Other harmless micro-organisms that may sometimes be found on the skin of a fish are *Desmobacteria*, a group of bacteria that form long thread-like vegetations, so that the layman could confuse them with Fungus when he sees them under the microscope. Actually the threads of *Desmobacteria* are much thinner than those of Fungus, and show other structures, whilst on fishes they have a totally different appearance. There is no tuft (resembling cotton wool) formed, but only a very thin veil. These organisms may be found mostly in water that contains a large amount of iron.



Photographs by the author.



(1) Carp with crooked spine (after Hofer). (2) Angel Fish showing skeletal and fin deformities (after Schaperclaus photograph). (3) Finta with mouth deformity. (4) Carp having deformed dorsal fin (after Hofer) and (5) Carp with deformed gill covering (after Hofer).

(Continued next page.)

In conclusion we may mention a few complaints of which the causes are not definitely known. In tooth-carps (*Cyprinus kribia*) an anomalous behaviour may sometimes occur. The fishes make peculiar shaking or swinging movements, whilst staying in the same place. The fins are retracted while the gill coverings are closed. No pathological symptoms can be found, either in the skin or in the gills but the colours are generally faded.

Since this behaviour will often occur when fishes are put in a newly-arranged tank, it is possible that it is a reaction to unsuitable water. In such cases it is advisable to change the water as soon as possible, with some from another source, or to remove the fishes from the tank and then to test the water on its pH reaction. Corrections of pH can be made by adding carbonate of lime to the water, if it is too acid, (i.e., pH value below 6.5; 6.8 may be considered a normal value) or phosphoric acid if the water should be too alkaline (pH value above 7.6; the most suitable pH range for most fishes is between 6.8 and 7.2). When adding phosphoric acid care must be taken not to add too much; after putting in some of the acid stir thoroughly and test the pH reaction again; repeat this until the desired value has been reached.

Swinging Sickness (as this condition is called) may also occur among fishes in tanks where the occupants have been present for a long time and where the water has a suitable composition. In such cases, it is possible that the abnormal behaviour could be due to chilling (if the temperature of the water has been too low) in which case the remedy is simple. Cases of Swinging Sickness in tooth-carps may be treated by changing the water and raising the temperature.

In literature, reports have been made recording cases of sudden paralysis and dying of fish and "fright psychosis", in which the fish try to bury themselves in the sand or try to hide themselves in other abnormal ways. It should be remembered, however, that some species of fish normally hide themselves in the sand, e.g. eels and loaches. Such behaviour may result from serious frights or shock caused by sudden changes of temperature, or other influences, but further details of the causes of this disease are not known.

In Guppies (*Lebistes reticulatus*) an anomalous behaviour may occur which is possibly related to that mentioned above. The fish show a peculiar restlessness and, if a person approaches the tank, they dart wildly through the water, dash against the glass and even bustle into the sand. Soon afterwards they become exhausted and remain near the surface. If they are disturbed they swim very sluggishly into deeper water. After two or three days they die. Nothing definite is known about the cause of this disease. Sometimes it is possible to cure the fishes by a rapid changing of water.

Deformities

In fishes, all kinds of deformities may occur. Very little is known of the causes. It has been presumed that lack of vitamins (especially vitamin D) could play a role in such cases, but this has not been proved. From several experiments and other investigations it seems that fishes can make vitamin D themselves in their liver and it is difficult to understand how lack of this vitamin could occur, except in cases where the liver is diseased. However, in most cases of deformities, no other diseases can be found.

Know Your Fishes

No. 18. Threadlike Fish

(*Copeina arnoldi*)



Photograph

By J. M. Zimmerman

Now that *Copeina arnoldi* (formerly known as *Pyrhulina filamentosa*) is becoming more readily available in this country it is an appropriate time to recount the unusual breeding procedure of the species. Its appearance is not outstandingly attractive, the body colour being an olive-brown becoming whitish ventrally. The mouth is of a darker colour as are the edges of the scales. Fins are longer in the male and in both sexes they are of a reddish hue, this being particularly conspicuous at the lower extremity of the caudal. There is also a reddish spot in the dorsal fin of the female but the male (illustrated) has a very obvious white spot present on that fin with a dark area immediately in front of it. This species is a member of the Characidae Family although it possesses no adipose fin.

The most favourable temperature is 72-75 deg. F. but for spawning this should be 75-80 deg. The actual spawning position is above the water level. This is presumably to protect the embryos from predatory creatures in the native haunts and, in fact, the eggs are

laid on a leaf projecting above the water level. In the aquarium a piece of roughened glass or slate may be introduced so that it projects above the water level and offers a surface to which the eggs adhere. Failing provision of material such as this the female will lay the eggs on the cover glass although the smooth surface often causes the ova to drop back in the water and be lost. When suitable materials are supplied the pair will only jump about two inches clear of the water surface but where the under surface of a cover glass is utilised they may jump four inches above the water.

The spawning tank should be of the 24 x 12 x 12 in. size and water having a pH of 7 or slightly less is recommended. After the male has selected a suitable spawning site he tries to bring the female below it, and, when successful, the pair jump clear of the water with bodies close together. For a few seconds they adhere to the selected surface above the water level and between six and twelve eggs are laid and fertilised before the fish drop back into the water. This operation is repeated until up to 100 eggs are laid. When the spawning is completed it is advisable to remove the female.

The male now assumes paternal duties for two or three days until the eggs hatch. These duties consist of splashing the eggs at 15-30 minute intervals to keep them moist. This is effected by his swimming under the eggs and then beating his tail vigorously so that water is splashed over the maturing embryos. Except at the times when the male is actually dampening the eggs he hides in plant thickets away from the spawning position, and a thickly planted area should therefore be supplied at one end of the aquarium. On hatching the fry fall into the water. It is recommended that the adult male be removed at this time. When free-swimming the fry require Infusoria followed by finely-sifted *Daphnia*.

Copeina arnoldi is found in S. America in the area of British Guiana and the Amazon Basin. When maintained in aquariums these should be kept covered.

Class: Pisces. Order: Ostariophysi. Family: Characidae. Genus: *Copeina*. Species: *C. arnoldi*.



CAPRICORN

Current Notes

Seasonal Tasks for the Enthusiastic Pondkeeper and Water Garden Owner



AQUARIUS

LOOKING back over the past season in the water garden, two things stand out as worthy of comment. One was a highly successful planting of Japanese Irises and the other was the prolific seeding of one of the Water-lilies.

Many years before the war, in the days when one could stock a garden for a few shillings, about a dozen un-named varieties of *Iris kampfieri* were purchased. These had come direct from Japan and there was pleasant surprise at the freshness and healthiness of the plants, notwithstanding their long journey. They were grown on for some time, split up every second or third year and the seed-heads were always cut off before they could develop so that the strength of the plant could go towards more and better blooms next year. When it was known that the owner would be moving to the country, it was decided to let the plants run to seed so that a new colony of them could be started in the new garden. Seed was gathered from the strongest and most beautiful varieties in late September and, after exposing to the sun for a few days for final ripening, they were sown straight away in a border out-of-doors, barely covering the seeds with earth so that frost and snow could get at the tough envelope.

Good Results in the Spring

Germination in the following spring was extremely good, and the resulting plants attained flowering size for the first time this season. Luckily this coincided with the completion of a new pond and it was decided to plant a two-foot border of them around three sides of it; this accounted for about a hundred of the new plants. In preparing the ground, about three barrow loads of vegetable manure from the compost

heap were incorporated and this, combined with the sunny and not too dry position, was responsible for the plants surpassing themselves. The wealth of magnificent blossom, ranging in colour from dove-grey to rich plum-purple, with markings of various contrasting colours, reflected delightfully in the water and made a lovely setting for the Water-lilies. Even in November their massed foliage provided some attractive autumn colour as the leaves turn bright gold as they die back. These Irises are singularly free from pests and diseases, are perfectly hardy and will flourish for many years provided that they are split up from time to time.

Many Seed Capsules Produced

Regarding the seeding Water-lily (*N. pygmaea alba*), it has never produced so many seed capsules as it has this year. These attain the size of cherries and, when ripe, they burst and release numerous small round bodies, each in a tiny transparent envelope. This latter is buoyant and, as a result, the seeds float on the surface and are carried away by movements of the water to some distance from the parent plant. It is interesting to note that this envelope only remains buoyant for a very limited time (although long enough to ensure that the seeds are properly distributed), after which the seed falls to the pond bottom and becomes buried in the mud. Here, if not too late in the year, it will quickly germinate and a couple of under-water leaves will begin to develop. Presently a slender stem carries the first tiny leaf to the surface and, before the season ends, the first of these seedlings will be putting forth tiny blossoms. In fact, the plant can almost be grown as an annual.

THE winter is, or should be, a quiet time for the coldwater fishkeeper. Outside in the pond the fish are resting and require the minimum of attention. Provided the pond has been cleaned, the fauna and flora remain dormant until the first flush of spring when the stronger light and warmer weather brings them all back to life again. Indoors the same sequence takes place although the change is not so complete. But here the same lack of activity should be encouraged except that the fish may require an odd Earthworm once a week.

It is fortunate that this slowing up of the life processes takes place since it affects the harmful organisms as well as the good ones. Were this not so, the mortality in fishes would be very much higher than it is at present. Low temperatures kill off many of the parasitical bacteria and protozoans and those that are not killed have their development inhibited. It is true that many forms encyst during the cold weather and are not destroyed but, nevertheless, their activities are considerably curtailed. Fishkeepers who do not recognise the beneficial effect of this period, and who interfere with the normal process of hibernation, are never really free from trouble in their fishkeeping activities.

From reports coming in from different parts of the country

From a Coldwater Fishkeeper's Notebook of Experiences

it would appear that Goldfish imported in large quantities from the Continent, and sold cheaply as soon as they arrive, are bringing with them their share of diseases which are not normally indigenous to this country. It cannot be over-emphasised that all such newly-imported fish should be isolated and not put with established stock until after a reasonable quarantine period. These new diseases, if allowed to remain unchecked, may seriously affect stock that is normally clean and healthy. There is a particularly virile form of parasitic protozoan attacking fry this year which is causing trouble. It would appear that it attacks protein matter both in fish and plants, which makes it all the more difficult to eradicate. Adult fish are not unduly affected but the effect on fry can be sufficiently serious to cause death, particularly where conditions are overcrowded or where the water is dirty.

First Symptoms in Fry

In the early stages the fry appear to be covered with a faint "bloom" which later gives way to exposed red patches, usually at the base of the fins. In the advanced stages the fins start to contract and the fish becomes emaciated. Some fry seem to be more resistant than others but if

the condition is present in a spawning, it is advisable to treat all the fish.

The incidence of Flukes is also on the increase. Here the disease is difficult to recognise in adult fishes since a large fish can support a tremendous Fluke population without showing any outward signs of distress. One method of detection commends itself and is based on the fact that strong light stimulates the parasites to increased activity. Allow the tank to remain in complete darkness for four hours and then suddenly switch on a powerful electric light above the surface. After five minutes, those fish affected will start to swim around very actively twitching their fins.

It is obvious that if the activities of these parasites are at a minimum during the very cold weather, then winter is the time to tackle them with the greatest chance of success as their vitality is at its lowest ebb. So much so that it is only during the winter that there is a reasonable chance of complete eradication. Opinions vary as to the best germicide but the writer favours Formalin (Formaldehyde 40 per cent) in the strength of five drops to a quart of water, keeping the fish in this for ten minutes, or less if they appear distressed. The tank and plants also require sterilising in order to render the cure complete and this should be repeated as soon as the spring comes round.

In the October-November issue of *WATER LIFE*, and in this series of articles, we advised keeping only the best fish from this year's broods of egg-layers for next year's breeding stock. Now we may enlarge on what is meant by "best fish". Firstly, it must be borne in mind that it is advisable to keep a good and equal number of male and female fish where this is possible.

Topical Suggestions for the Keeper and Breeder of Tropical Varieties

It should also be pointed out that if the sexes are separated as soon as possible the fish will grow larger and more quickly so that they

are ready to spawn in the spring.

The livebearers have to be drastically sorted out in the same manner as the egg-layers in order that they may be line-bred and allowed to produce extra good fish which are worthy of showing and breeding from. There are a few good Red *Platyplatilus maculatus* and Red Swordtails around but not very many, unfortunately. It would be doing the hobby a great service if aquarists interested in livebearers would only breed from the largest, best shaped, and best coloured fish. To breed from the deepest bodied and the red (not orange) coloured Platies would help us to get a little nearer to the show standards. There are many different colours and colour patterns in Platies and they should not be allowed to remain mixed in one tank.

It is also preferable to avoid breeding from brother and sister fish. Most of the aquarists specialising in livebearers have stressed this point. We have found that the best way of preparing a tank for breeding livebearers is to introduce plenty of Lesser Bladderwort and Floating Fern etc. Place the virgin female with the male in this tank and, about a week before the young fish are due to be born, remove the male. After the birth, take out the female.

By separating the sexes prior to mating it will be quite certain that the female has been mated with a good quality male of the owner's choosing. It will also be found that it is much easier to keep records concerning a particular pair when controlled breeding along the lines suggested is employed, e.g., how many young the female has delivered, how many males and females develop, how long should elapse before she has another brood. By employing these methods the hobby becomes more interesting for the individual and they also ensure the production of much higher quality fish.



Photograph

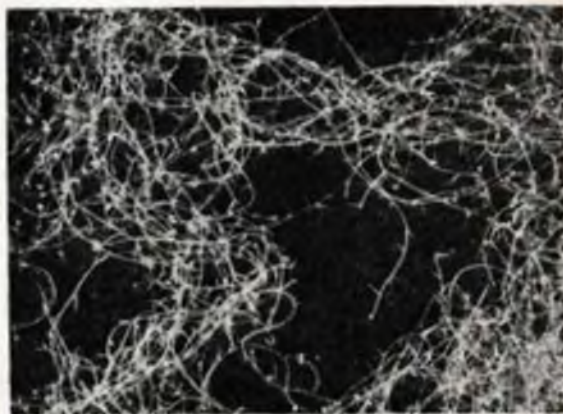
(G. J. M. Timmerman)
A brood of well-grown young Wagtail Platies.

Although we have often heard it said by the coldwater enthusiast that any one can breed tropical fish and they turn out "like peas in a pond", it is not quite as easy as that. Tropicals need just as thorough culling as coldwater fish.

Sometimes there are fish without dorsal fins or, in the case of Beacon Fish (*Hemigrammus ocellifer*) for example, with no adipose fins. Other fish which can be mentioned are *Barbus oligolepis*, *Barbus tetrazona* and *Barbus titeva*. These species have often been known to be born with deformed tails or without any tails at all. Even if they eventually recover from these deformities it is very unwise to breed from such stock. The body and head should be of as perfect a shape as possible and it should be ascertained that the eyes are functioning properly before stock is chosen for breeding.

In the case of Gouramies, these fish should have a single pair of straight feelers. This also applies to Angel Fish. Any that have two or three feelers on each side are not good show fish. Always keep the Dwarf Gouramies (*Colisa lalia*) which have the most perfect stripes and the best colour.

It has often been said that inferior parent fish do not produce bad stock but, although this may be true on occasion, it is far better to breed from the best fish we have. This is really the only way to raise the standard of show fish and that is something which we should always try to achieve. There is nothing worse than one badly shaped fish in a community tank. It seems to attract one's attention more than all the other perfect ones and we hear friends say "fancy keeping that". After all it is far easier to cull the specimen when it first shows serious deformity.



Photograph

(G. J. M. Timmerman)
Bladderwort, a plant for livebearer breeding tanks.

Cult of the Veiltail

Popular Appeal of the Variety and Investigation of Metallic, Nacreous and Matt Scale Groups

By Capt. L. C. Betts

IT is 20 years since I was first attracted to the Veiltail and no fish, before or since, has impressed me more. Aesthetically it has dignity, colour and form and it demands patience, application and understanding for its maintenance and breeding. It also provides a field of unlimited exploration and, in its serious study, a fund of knowledge is gained and there is a sense of worthwhile endeavour. These qualities, it might be argued, can be applied to most aquarium fishes but this is not the case, in my opinion. As a tropical fish-keeper I never learned to know one fish properly for, as soon as I had wrested the secret of its breeding, I lost interest and only regained it by transferring my attention to another species. With the Veiltail, however, each spring is a period of fresh endeavour for me as I realise how far there is to go before all details of the fish and its breeding are known. It is therefore with a sense of limitation that I shall discuss this most complicated of all the aquarium fishes.

In the first place it is a man-made variety and it represents one of the highest forms of fish development. Evolution has produced some extraordinary adaptations, the first that comes to mind being the Lung Fish which can live in and out of water by transferring the respiratory process from the gills to the lungs. This is only one example of what changing environment has brought about. The case of the Veiltail is different since it has no characteristic, that can be readily recognised as being derived from its ancestor, the original wild Carp, from which all Goldfish varieties have been evolved. If one takes a multi-coloured Nacreous (Calico) Broadtail one finds that every external characteristic has been modified, i.e. doubled tail of exceptional length with the forking eliminated, fins three times their original size, a coloured eye, a spherical body, a shortened head, and a range of colours that seems to come out of an Arabian Nights' story. This is very different from its earliest relative whose sole claim to immortality was the delicacy of its flesh. All this development was achieved in less than 500 years, a very short period compared to the slow processes of evolution. Nevertheless the process has been long and arduous and the aquarist that lightly crosses a Shubunkin with a Veiltail for the sake of expediency would do well to consider the years of endeavour which he is destroying in one fell swoop.

There is a widely held belief that the Veiltail is a delicate fish requiring special conditions, chief of which is supplementary heat in the winter. Nothing is farther from the truth since it requires no more special treatment than one would accord to any other line-bred animal. If one's fish-keeping goes no further than a small cheap aquarium and a pinch of dried food daily, then the Veiltail is obviously not

the fish to keep. If, however, one appreciates a pedigree creature and is prepared to feed and house it properly, then that person should be very successful with Veiltails.

Actually the temperature range for Veiltails is between 45 and 65 deg. F. and at these temperatures it will breed, thrive and live to a ripe old age, up to 15 years in fact. This at once entitles the Veiltail to be called a coldwater fish and, interpreted in terms of the British climate, this means that it can be kept in an unheated greenhouse, without supplementary heating, for at least nine months of the year. It will stand freezing in without harm, provided it has been properly bred and the conditions are not prolonged beyond four weeks.

It is, however, essentially an aquarium fish for I have yet to discover anyone who has acclimated it to all-the-year-round pond conditions. In fact my own experience goes further than this for I have found that it is the exception rather than the rule for a high-quality fish to be produced from spring and summer rearing in a pond. Potentially good fish will not develop and good fish will deteriorate although their general physical condition is good and they seem very healthy after their summer pond sojourn.

Its food requirements are not unduly complicated and the only distasteful job is the cutting up of worms. The owner must also provide the world in which the fish lives and here lies the chief reason for the unsuccessful attempts to keep these fish. It should be realised that overcrowding is just as harmful to Veiltails as it is to humans. No amount of

aeration can take the place of a generous allowance of water capacity which, combined with normal hygienic "house keeping," produces disease-free conditions that are so necessary and desirable. Intending fanciers will commence right if they forget such outworn ideas as "an inch of fish to a gallon of water". A formula based on age and weight gets nearer to the truth, for instance—a gallon of water for every six months of age or half ounce of fish. Any formula will be unreliable unless the temperature of the water is taken into account since a 2 in. fish which is happy in two gallons of water at 50 deg. F. will be extremely unhappy in the same volume of water at 75 deg. F. As the temperature rises so the available oxygen diminishes and no fish reacts so quickly or more obviously to poor oxygen concentration as does the Veiltail. Despite this, it is not a difficult fish to maintain.

Scale Groups

The Veiltail is normally found in two Scale Groups but there is a third which is really an intermediary of both. The difference in the groups is found in the amount of "shine" in the scales of the first and second mentioned Groups, there



Photograph

L. F. Perkins

An adult Veiltail in a pose which emphasises the flowing finnage but slightly distorts the upper body contour.

.....WATER LIFE Glossary of Terms.....

ORGAN—A part of an animal or vegetable organism which is developed for a special purpose, e.g. kidney, which is normally responsible for excretion, and sometimes water regulation, in vertebrates. The organ may consist of one or a number of different sorts of tissue.

PARAMECIUM—One of the microscopic protozoans, commonly known as the Slipper Animalcule (because of its shape), which belong to the Order *Holotricha*, the members of which are covered with cilia of similar proportions. In places the cilia form an undulating membrane which in *Paramecium* is utilised to waft particles of food to the creature. *Paramecium* feed mainly on bacteria and may be encouraged to reproduce by supplying a vegetable infusion as is done when *Infusoria* are cultured for feeding to fry. *Paramecium* are normally present in great numbers in such cultures.

QUINTANA ATRIZONA—One of the Livebearing Tooth Carps belonging to the Family *Poeciliidae*. It is a peaceful fish which is not particularly common in this country. *Q. atrizona* is a native of Cuba and grows to a length of between 1 and 1½ in. depending on the sex. The name *Quintana* refers to the fifth ray of the male gonopodium which is of unusual construction. The barring on the sides of the body is suggested by the specific name, *atrizona*.

.....Second Series (Continued).....

being the maximum shine in the former and a complete absence of shine in the latter. The shine in the intermediate Group may range from practically no shine at all to quite a lot which is usually located in individual scales that fanciers refer to as "scales" in so-called "Calico" fishes. The two main Groups are known as Metallic Scaled and Matt (Transparent) Scaled. These are genetically dominant in that they will breed true to their scale Group if correctly mated. If the first is mated to the second then all the young will be in the Intermediate Group. The Intermediate Group, if mated, will not breed true and because of this it cannot be considered a true division. Usually the offspring fall into three Groups in the proportion of 25 per cent Metallic, 25 per cent Matt and 50 per cent Nacreous (varying degrees of shine).

Colour is quite separate from the "shine" factor and, in the metallic group, silver (white), black, orange and yellow are found, whilst in the Matt and Nacreous Groups black, blue, orange, yellow, white and brown, together with intermediate shades of one or more combinations, are there.

Metallic Group

The Metallic Veiltail can be a very lovely and vivid fish. It is usually more hardy than members of the other Groups and it is a great pity that this Group has been allowed to fall into disfavour. The reason for this is easy to understand for, unlike the Matt and Nacreous fish, it is late in assuming its adult colour and remains a dirty dull colour until it does so. This change can take place after three months but, on the other hand, it may never take place at all. Opinions vary as to the reason for this. Some people say that certain elements in the water are necessary which are lacking in most British waters, others state that heat and light are necessary. My experience is that whilst all three reasons can influence the rate of change, the change itself is governed by hereditary factors. In other words a fish must be bred for a quick colour change, which means that only those that turn colour quickly should be used as breeders.

Since a good body and finnage development are also required, there is always a temptation to use fish which are slow in changing colour. The result is that the fish may pass on this characteristic to most of their young. The Metallic type is consequently not a popular Group with the breeder

who wants quick results. This Group is quick growing and in a spawning of mixed Groups, will usually outstrip the others for size.

Nacreous Group

Unlike the "shine" of the scales of fish belonging to the Metallic Group, which is hard and burnished looking, the "shine" of the Nacreous Group is dull in some lights and iridescent in others. Some describe it as a mother-of-pearl shine but, as previously stated, the range of intensity extends from a pronounced shine to hardly any at all. Where the shine is like mother-of-pearl, the colouring is usually intense but, where the shine is faint, the colouring is more often pale and anemic.

It is appropriate to record here that colour pigment can appear at varying depths from the outer skin and usually the nearer it is to the body tissue the fainter the colour appears. For example, the body itself is encompassed by protective tissue made up of several layers. It is possible to have colour in any part of the scale tissues, which could in turn be overlaid by another colour. If the colour in an upper layer of the skin is deeply pigmented the colour in the scale tissue would not be visible. If, however, the colour was poorly pigmented, the colour in the scale tissue would show through, displaying a composite colour.

Thus orange over blue would appear mauve. The so-called blue colouring is intriguing since it is rarely black and, according to the position in which it is located, so it changes its character. For example, where the black appears on the outer skin or just below it, it shows black. But where it appears on the scales it is blue and, on a lower layer, pale blue. The black mottling in the Nacreous Veiltail is therefore always somewhere near the surface whilst the blue ground colour is located either in the scale tissue or beneath it. Unfortunately the blue colouring is very unstable and it is not uncommon for a beautifully coloured blue fish to be white by the time it is 18 months old. Strong sunlight could cause this and Nacreous fishes, whilst needing some sun, should be guarded against an excess.

Matt Group

The Matt or Transparent Group of Goldfish is, as the name suggests, that in which there is no reflecting tissue in the scales. The effect can be compared with that of a piece of glass and, as with coloured glass, it is possible to see through it. In fact the analogy can be carried further by saying the Metallic is like a mirror, the Nacreous, plain glass with whitewash on the back, and the Matt, just plain glass. If one stains the glass red, white or blue the parallel between the glass and a Goldfish scale should be fairly obvious. However, there is still another factor which influences the appearance and that is a compound known as guanine. E. G. Weatherly, who has carried out a series of experiments and research for the Goldfish Society of Great Britain, maintains that the Groups have varying quantities of guanine in the scales and these have a direct bearing on the shine and colour. He says that the maximum amount is found in the Metallic Groups and those Metallics which will not turn colour contain the most. Conversely, the true Matt or Transparent contains none at all and it is in the control of guanine that we shall ultimately find the answer to the colour problem. In my view, Mr. Weatherly has made the biggest contribution to Goldfish research of the last 20 years. It is necessary to point out that, whilst the Matt Goldfish will produce 100 per cent Matt fry, if truly mated, it is also necessary to be quite sure the parents are themselves truly Matt. A true Matt has no shine whatever and, when held in a net the body organs can be clearly seen. The gill plates are a bluey-pink colour and the eyes are black. Usually this group is very delicate and must susceptible to temperature changes, apart from being rather finicky feeders. The result is that under normal rearing conditions most of them die off before they are 14 days old.

(To be continued.)

Modern Technique for Tropical Fish Culture (2)

Simple Form of Circulating System With Some Possible Additions and Modifications

By C. D. Hughes

HAVING, in the introductory article of this series, compared the biological conditions obtaining in a natural pond with those which are to be found in the ordinary static fish-tank, and shown the inadequacy of the latter, I can now describe in its simplest form the method of overcoming these biological defects of the ordinary aquarium and, in addition, how to reproduce fairly closely the natural water conditions under which we may expect the fish to thrive.

It was shown that the chemical content of water under natural conditions depends upon the activities of a large range of organisms which can mainly be grouped under the headings:—bacteria, protozoans, worms and crustaceans. Unfortunately, except for the first and to a small extent the second of these groups, these organisms cannot be maintained in the restricted space of the ordinary aquarium. This is because they are also the organisms on which fishes feed and there is insufficient cover in even a lightly stocked tank for them to escape from the attentions of their natural predators.

The solution to the problem is to give these essential organisms their own quarters, and this is most easily managed by keeping them in a separate tank. If this separate tank is linked to the tank used to house the fish and the water circulated continuously through the two, both of them will then function biologically as a single unit. In this article I shall describe the setting up of such an arrangement. Its biological operation will be dealt with later.

The most suitable type of tank to use is the standard 24 x 12 x 12 in. size, and two of these should be linked together as shown in Fig. 1. In this diagram the circle shown in the left-hand tank represents a tall jar, the top of which should be about an inch below the top of the tank. The short double-shafted arrow is an air-lift carrying the water from the jar to the tank. This air-lift can be constructed, as described in my earlier series of articles, by placing a diffuser beneath an upturned filtering funnel and extending the stem of the funnel to lead over the top of the jar. This arrangement is more efficient and less likely to get blocked in the conditions under which it will be used than the ordinary type of air-lift. The water drawn from the jar, which may be called a "sump," is replaced from the right-hand tank, from which it syphons along the tube represented by the arrow marked A. Water returns from the left-hand to the right-hand tank by the short syphon at B, thus maintaining a continuous circulation.

The syphons, which are made of glass tubing, are best constructed in two L-shaped pieces joined together by a



Fig. 1. Small circulating system using the author's suggested arrangement of two tanks and two syphons (A and B).

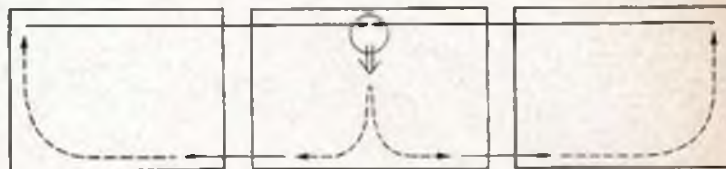


Fig. 2. A circulating unit designed for three aquariums. There is only one sump centrally positioned in the second tank, but four syphons are necessary.

short collar of rubber tubing. This facilitates cleaning as they can then be disconnected at the joint and it does not become necessary to negotiate any bends to get at the middle section. Short syphons can be made of two similar L-shaped pieces. Longer ones should have the joint near to one end to prevent sagging, while very long ones are best made in three pieces with a long straight centre section. These three forms are illustrated in Fig. 3.

In adapting the original coldwater range to tropical conditions various modifications have been necessary. One of these is that shorter and more compact ranges have replaced the extended multi-tank unit used for cold-water fish, though extended ranges of a rather different pattern can be used under certain conditions which will be

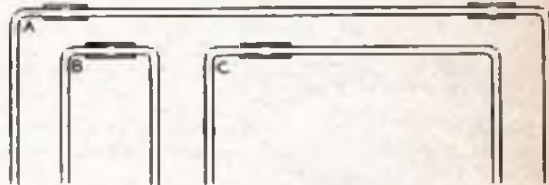


Fig. 3. Syphons of glass tubing with rubber connections. (a) A very long syphon with three pieces of glass tubing to prevent sagging. (b) Short syphon and (c) Syphon of reasonable length with connection towards one end.

covered in a later article. There are several reasons for the change but the one which concerns us at the moment is that heat is conserved more efficiently in a compact range with short connections. For this reason the sumps are now placed inside the tanks instead of being set up externally where their considerable surface area would result in a very serious heat loss in cold weather. The inch of clearance which has been allowed between the top of the sump and the top of the tank is to allow space beneath the cover glass for the outlet of the air-lift. The corners of the cover glasses will have to be cut away to admit the ends of the syphons and the necessary air-lines, but these can be the same openings as are used for the leads to the immersion heaters, which are the usual method of heating.

The right-hand tank is layered with gravel and planted in the usual way, while the left-hand tank, which will in future be referred to as the sludge tank, has only a thin layer of coarse gravel at the bottom and should be liberally stocked with the various organisms already referred to: e.g., Asselids, Gammarus, Daphnia and other Cladocera, Cyclops, Tubificids, Cyprids, etc. The smaller organisms which are necessary (protozoans and Rotifers) we need not worry about as they

will almost certainly be introduced into the system with the plants in the other tank. Care should be taken, however, to ensure that, when introducing plants, they are completely free of snails or their eggs as these can cause trouble by getting into the syphon tubes and causing blockages.

All that remains to be done now is to leave the system continuously circulating, during which time the sludge tank should be fed with crushed lettuce or similar organic material. After about a week the system is ready for fish to be introduced into the right-hand tank.

It may be thought that this arrangement involves a considerable waste of tank space that might more profitably be devoted to housing fish, but it must be understood that in the one tank to which they are restricted, it becomes possible, with continuous circulation, to raise at least a hundred and fifty young fish in a vigorous and healthy state,

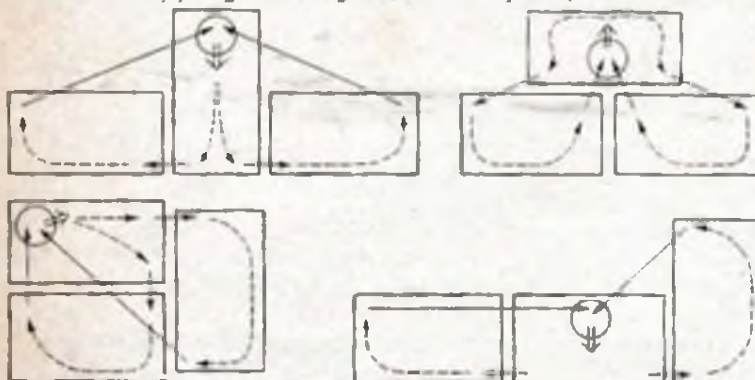


Fig. 4. Alternative arrangements of tank batteries. These enable the circulating system to be adapted to the space available as the tanks are not placed in line.

up to about 14 in. in length. Moreover the above arrangement, which has been explained first for the sake of simplicity, does not represent the most efficient application of the technique. The same sludge tank that has already been described can be made to serve a second fish tank placed at the other side of it as shown in Fig. 2. This second tank will then house another hundred and fifty fish. In this case, the sump, as shown, has to be moved to the centre of the sludge tank so that the water drawn from the fish tanks at either side will diffuse equally through the sludge tank before being returned.

It will be seen that under this system tanks must be arranged horizontally instead of in tiers and this may create space problems. However, although in Figs. 1 and 2 the tanks are shown in line they may be arranged in other ways to fit the space available. Fig. 4 shows some other possible arrangements. Where two or more tiers of tanks are set up alongside each other, those on the same level can be connected horizontally to make independent ranges, one above the other.

The system has a certain flexibility and this extends to the sizes of tanks used. They need not all be similar although the sludge tank is best kept at not less than 24 x 12 x 12 in. as the water will pass too rapidly through a smaller tank. It is important to keep this factor in mind where tanks of different size are used to house the fish. In order to keep the rate of water renewal at a similar rate for both tanks the tubes used for connecting up the smaller ones should be of a smaller bore.

As the majority of people desiring to set up a range will need to adapt the system to their own space problems, I will conclude this article by giving a list of the essential features which must be adopted.

1. The inlet and outlet points in every tank should be as far from each other as possible; if it is not always convenient to have them at opposite corners they should at least be at opposite ends of the tank.

2. As far as is consistent with the previously mentioned consideration exposed sections of all syphons should be as short as possible to avoid heat losses. Those people, however, who are fortunate enough to have space heated fish houses can, of course, disregard this point and can, with advantage, place the sump outside the sludge tank as in a coldwater range.

3. The rate of flow should be adjusted to the size of the tanks that are used. The following data should help in achieving this. An air-lift, as described earlier, will circulate about eight gallons an hour. Using two 24 x 12 x 12 in. tanks, this gives a displacement equal to the capacity of the tank every one and a half hours. Though this is more than is necessary it is not harmful. Using two tanks, as in Fig. 2, the rate of displacement in the reservoir remains the same but it is halved in each of the fish tanks, i.e., the volume of each tank is displaced every three hours, and I have found this to be satisfactory. If larger tanks are used two air-lifts are necessary to maintain the same rate of flow and, in these circumstances, it is preferable to have them operating in separate sumps placed alongside each other in the reservoir. This secures the independent drainage of each tank and, in the event of any minor blockage of the syphons, will set up sufficient pressure to clear the obstruction instead of allowing the whole flow to be diverted to one tank. Large tanks will require long syphons as well as a faster flow. As both these factors will increase the frictional loss which occurs in all piping through which liquids flow it is desirable to duplicate all syphons. Such a measure will also provide an added safeguard against possible blockages.

Where the same sludge tank is serving tanks of different sizes, it is easier, unless one of the tanks is extremely small, to adjust the flow by duplicating the syphons in the larger tank rather than by reducing the bore of the syphons in the smaller one. This is because small bore tubing offers too great a resistance to the flow of water and easily becomes blocked. Even when one of the tanks is very small, tubing of less than $\frac{3}{8}$ in. should not be used. One $\frac{1}{2}$ in. bore is the smallest that can really be advised.

4. To prevent the escape of fish the ends of all syphons must be covered with strainers where they open into the fish tanks. The small plastic ones which are on the market can be used although they are, perhaps, a little small. They can, however, be made from small aluminium boxes which are easily punched all over with very small holes. A hole is cut in one end to fit the syphon tube which is inserted and held in position with a rubber band. The band will perish in time but it usually lasts for over six months. The inlet side must also be covered for even very young fish are incredibly strong swimmers and some of them will travel against a strong flow through several feet of tubing and reach the sludge tank. The most suitable arrangement for this side is made by quarter filling a jam jar with coarse gravel, made up of small stones of about $\frac{1}{4}$ in. in diameter. This jar is rested on the bottom of the tank and a glass chimney is placed inside it with the bottom edge buried about $\frac{1}{4}$ in. in the gravel and the top edge above the level of the water where the syphon outlet feeds into it.

5. Where it is possible an arrangement in which the tanks are closely packed together is recommended as this minimises heat losses.

6. The entire range must be well illuminated and, where it is not in a position to receive direct sunlight, artificial lighting must be adopted.

7. Circulation of the water should be continuous and consequently a good pump, which has been designed for continuous duty, will be required.

Species of Characins Old and New

By Elizabeth Harrington

(Continued from previous issue)

— Illustrated by Kathleen Cooke Photographs —



Glowlight Tetras (*Hyphessobrycon gracilis*) are peaceful members of the Family which come from Guiana. Here is a female of the species. At breeding time, the pair embrace, after which the eggs are exuded, and then fertilized.

THE species *Epiplatys microlepis* which I referred to at the end of my last article shows different characteristics between the young and the parents.

The adults swim at times out of the horizontal, with a slight head downward poise, as do some other members of the Family. The youngsters keep to an even keel. These fish live together quite well and make a good show if six to twelve at a time are put into a planted tank. Slow moving or virtually still for periods, they will suddenly dart about for food, when their yellow colour gives a pleasing contrast to the green background provided by the dense foliage.

Spawning in Shoals

Unlike so many other fish, these will spawn as a shoal when the eggs are laid in amongst fine-leaved plants. The thickness of the plants permits some of the eggs to remain undiscovered and so be uneaten. The young hatch out, a percentage survive and they soon look after themselves. In the breeding season, the pairs will sort themselves out when the male chases his selected female in and out of the plants until she drops her eggs.

The eggs hatch out after thirty hours or so and a constant supply of infusoria must be given from the first; later larger forms of livefoods and then a little fine dried food. Temperature range 70-80 deg. F.

Epiplatys paraguayensis. (Amazon) Length 3 inches. Here again, we have a species which has not been seen, so far as I know, in this country but which has been kept successfully in North America. Rather long in body, it is, nevertheless a Characin, with an adipose fin. The large dark spots, one a little to the front of the dorsal and the other at the base of the caudal peduncle, look prominent against the silvery body.

So far, I have tried to describe in detail some of the many members of the *Characnidae* Family

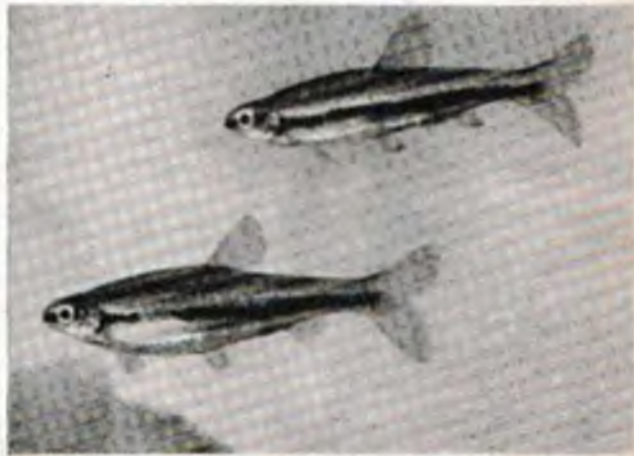
but it would be impracticable to attempt a full account of all the species which it includes in this way. I propose, therefore, to conclude this series with a general review of some of the popular species and hope to deal more fully with individual species in separate articles, from time to time.

The more we try to give a picture of the habits and ways of the Characins the more apparent it becomes that a difficult task has been undertaken, for there are marked differences in shape, size, colour, feeding, breeding and, in fact, in so many things that it is hard to believe that the fishes under review do all belong to the one Family. Compare for instance *Pyrhulina rufostriata* with *Metynnis roseireliti* and then take a glance at the Black Widow (*Gymnoconetris terezi*).

I have always advocated specialisation and within the Family we have certain groups which lend themselves to considerable study. Let us look, first of all, at the so-called Tetras. These embrace such favourites as the Hyphessobrycons including *H. bifasciatus* or Yellow Tet, *H. flammescens* or Flame Fish, *H. gracilis* or Glowlight Tetra and *H. heterorhabdus* formerly called *Hemigrammus ulreyi* but which name is correctly applied to another species. Among the other Hyphessobrycons are the popular Neon Tetra (*H. innesi*), the Lemon Tetra (*H. pulchripinnis*), *H. rosaceus*, the Black-line Tetra (*H. schulzei*), *H. serpa*, and the Dawn Tetra (*H. eos*).

Equally familiar are the *Hemigrammus* species. They are of like appearance so far as the general body shape is concerned and of a similar, average size, ranging from 1½ to 2½ or 3½ inches. Amongst the largest is the so-called "Tet from Buenos Aires" (*H. caudovittatus*). It is a clumsy popular name but serves to indicate the part of the world from which it comes. With its reddish fins, bluish silvery body and distinctive marking near the caudal fin it is of commanding appearance, especially as it is one of the largest of the several *Hemigrammus* species.

There are others of equal interest, including the Head-and-Tail Light Fish (*H. ocellifer*) with its bright eye and irides-



A pair of *Nannostomus anomalus*, with the male at the top. Somewhat like the *Pencilfish* in appearance, the *Nannostomus* species all lack an adipose fin.



Popular because of its peaceable disposition, the Flame Fish (*Hyphessobrycon flammeus*) is to be found in many aquarists' collections. Here is a female. The males have hooked anal fins.

cent tail marking which together give rise to the dealers' name for it; *Hemigrammus pulcher* with its distinctive black marking and the Feather Fin (*H. uellineatus*).

The *Hyphessobrycon*s and the *Hemigrammus* are relatively easy to breed and for that reason, they are widely kept. Shoals of them look most pretty, swimming about in a well set-up aquarium and, since they are not particularly aggressive, they can be included in community tanks where their active ways, their coloration and their general attractive appearance make them a constant source of interest. I must not overlook the fact, when generalising about breeding, that it is necessary to point out that some species are difficult to get to spawn and I believe the reason is that we do not yet understand the conditions they require.

When breeding fish, as other living creatures kept out of their natural environment, we have to study them to find out what they prefer to eat, the conditions under which they flourish best, the temperature and, above all the condition of the water. I am certain that the water supply has much to do with success or failure and experiments on the Continent of using water received from other parts of the same country have resulted in success being achieved after many failures with the local water supply. I must, however, warn readers that I am talking of entirely different water supplies and am not advocating trying to change existing water by adding chemicals, as this usually leads to trouble.

Alterations of *Pristella riddlei*

Somewhat similar in appearance to the *Hyphessobrycon*s and *Hemigrammus* is the delightful little *Pristella riddlei*. There are great contrasts in the coloration of the body and the black and white markings on the fins and the species is one that can, to advantage, be put amongst more brightly coloured specimens, if only to set off their more colourful appearance.

Now let us turn to two popular Monkhausias—*M. oligolepis* and *M. pittieri*. The former is the larger but both have rather full bodies, the latter possessing more shapely fins, particularly the dorsal in the male.

M. oligolepis has a dull body colour with a large spot of black near the tail. A distinctive feature is the dark edging to the scales while near the adipose fin is a small area of bronze or gold which stands out well.

M. pittieri, which has been bred successfully here, has a silvery body with a bright metallic sheen which gives the impression of greenish highlights over different parts of the body. The rather subdued overall colour, apart from the sheen I have mentioned, is in distinct contrast to the red of the eye which fairly blazes under some lights.

Hatchet Fish in the Aquarium

Within the Family come the Hatchet Fishes and I have already referred to the *Carnegiella* species. Allied to them is *Gasteropeleus levis*. Some recent importations have been quickly snapped up but I wonder how long they survived? These fish need plenty of room and the opportunity to break the water surface. It may be that they provide an interesting study but I do not regard them as being ideally suited for aquarium conditions unless their especial wants can be provided.

Another contrast is the difference in appearance between the *Metsynis* and *Colomesoma* species, and the *Nannostomus* and *Pencilbrycon*. The former are big, round plate-like fishes whereas the latter are long in shape, earning for the *Pencilbrycon*s the common name of Pencil Fishes.

The *Nannostomus* include *N. anomalus*, *N. marginatus*, and *N. trifasciatus*. All from South America, they average 1½ inches long and have the length of their bodies, in relation to other proportions, emphasised by dark lateral lines. *N. anomalus* has a long black band, with a yellowish gold above and a whiter colour below.



Usually found swimming at an upward angle, Pencil Fish (*Pencilbrycon*) make a contrast in any tank, with their distinctive lateral lines. Here is *P. auratus*, a little shorter and less showy than *P. unifasciatus* but much sought after by aquarists.

The yellow eye is in line with the black lateral band which extends to the mouth. As opposed to the whitish underparts, the dorsal areas are a dull green. This fish is interesting to watch for its movements remind one of a car braking every so often. After swimming briskly about the tank, specimens will suddenly stop, appear to hover for a few seconds and then move on again.

Somewhat similar in appearance is *N. marginatus* although the body is a little fuller. Once again there is a centrally placed dark lateral line or band but instead of an upper yellowish strip to it, it is surmounted by a reddish area, then yellow, another darker line and a greenish dorsal area. The underparts are silvery white. The fins have dark red markings. Many aquarists will think that of the two, *N. trifasciatus* is the most prepossessing in appearance and certainly the colours are brighter.

The Pencil Fishes familiar to us are *Pencilbrycon auratus* and *P. unifasciatus*. The former adopts a position out of the horizontal, with the head pointed upwards, as sometimes does the latter though *P. unifasciatus* seems to like a normal position to swim in just as much.

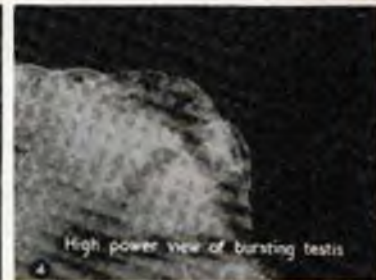
Another species seen here in recent years is *Nannostomus unitanatus*. It has a dark lateral stripe with, above, a yellow hue which tends to become a little more red towards the tail. The tail itself has a reddish area.

I would like to deal finally with the *Neotomas* of which several species are appearing in small numbers. These are from the West Coast of Africa. Some have a reddish flush over their bodies while others have a preponderance of green, the males usually showing the more colour. A broad line, wider than a stripe runs down the body from behind the eye to the base of the tail. They have been kept satisfactorily in 20 deg. F.

Aquarium Biology

Sexual Reproduction in *Hydra*

An Autumnal Occurrence as Cold Weather Approaches.
 Details of Ridding Affected Fish Tanks of these Pests



WHILST the more usual method of reproduction in *Hydra* is asexual in the autumn sexual reproduction does occur. The reason is not difficult to diagnose for under natural conditions the colder weather causes the eventual death of the adult animals and provision has been made for the perpetuation of the creature by the presence of a particularly retentive stage in the sexual reproduction cycle. This stage survives the winter and there is then development into a normal adult *Hydra* when the warm weather arrives.

Bi-sexual Creatures

A single specimen of *Hydra* is an hermaphrodite, i.e. it possesses both male and female sexual organs. The former, testes (fig. 1), normally reach maturity before the latter, ovaries (Fig. 2), and this prevents self-fertilisation occurring. In both the ovaries and testes the appearance is similar initially. A bulging of the outer cell layer (ectoderm) occurs and a large number of small cells are produced. In the male organ these divide to form the spermatozoa whilst in the female organ only one cell develops to form an ovum with yolk granules (Fig. 3).

Fertilisation is effected by the ectodermal layer surrounding the testis breaking and the spermatozoa are released into the surrounding water (Fig. 4). Partially by swimming movement and partially by water currents, the spermatozoa are transferred to the ova of other *Hydra* (Fig. 5). Fertilisation occurs and a zygote (fertilised egg) is formed. Cell division then takes place and the cells are positioned around the inner perimeter of the zygote. There is then more cell division and the cells encroach into the inner area. In the

final stage a hollow space is left in the middle and this is the enteron. Whilst cell division is being effected a tough outer layer (cyst) to the embryo is being secreted.

After these processes the embryo drops from the ovary (Fig. 6) and remains on the bottom of the pond until the following spring. With the commencement of warm weather it breaks clear of the cyst, a mouth is formed and tentacles emerge (Fig. 7 right to left). The young complete *Hydra* is then ready to recommence the life cycle.

Hydra are insidious in that they are ruthless in devouring fish fry but they are entirely harmless to larger specimens and, in fact, certain species of fish will eat these pests, notable among them are the Gouramies. Certain snails (particularly *Limnaea*) will also keep these creatures under control but will not entirely eliminate them from an infected aquarium. A sure method of ridding an infected tank is to remove both fish and snails and introduce a quantity of household ammonia to the aquarium water—one teaspoonful of ammonia per five gallons of water. The solution should be run off after two hours, the tank washed out and the fish and snails then returned.

Algae Within the Organism

There are a number of *Hydra* types which are known popularly as Brown, Green, and Grey *Hydra*. Unicellular algae (zoochlorellæ) in the endoderm of the Green *Hydra* explain the green coloration of this species.

The photographs are from the Gaumont-British film strip, S3, entitled "*Hydra*". Films have also been produced.



Breeding White Worms (*Enchytra*)

Success is Assured When Pure Cultures, A Fibrous Medium and Regular Fresh Food are Provided

By Mrs. W. Rockingham

MANY aquarists seem to find difficulty in achieving success when breeding White Worms and, as I have had a continuous supply, without any fresh introduction, over a period of many years, I will give some information on the method which I employ.

I started in this way. At the end of the garden there was a matured compost heap consisting of fallen leaves, household vegetable refuse and poultry manure. Turning it over one day in search of some soft red worms for fancy goldfish, I came across a little cluster of White Worms. These I picked out with forceps and placed in a box of the compost, and then continued to search for further supplies.

It was chiefly among the old poultry manure that I found them so I was able to lessen the tedium of the work by knowing just where to look. It was a slow business picking out just two or three at a time, but I renewed the search on several occasions, until I had sufficient for cultures in three separate boxes. It is a good plan to divide them in this way, so that if one box proves unsuccessful one has not lost the whole stock.

The Importance of Moisture

The earth should contain plenty of leaf-mould or rotting leaves and should always be kept moist, but not wet. For food I find they thrive best on porridge (without salt), which I place in small spoonfuls in hollows made in the soil. I do not cover the porridge with earth, as the worms are more easily seen when they cluster round the food. This saves too much stirring up of the soil which disperses the clusters of worms. Another satisfactory and more easily prepared food is bread (preferably brown, as it is purer) soaked in milk.

When the stock has increased so much that they can be seen adhering densely around each portion of porridge, they

can easily be picked up in little bunches with forceps. Another good method of separating the worms is to place a sheet of glass, an inch or two smaller than the box (after it has been immersed in water), directly on the earth. The wet glass seems to attract the worms and quite a number adhere to the wet underside. These can either be picked off with forceps, or washed straight into the aquarium.

Souring and Invasion of Flies

There are two contingencies to guard against in breeding White Worms. The first is deterioration of the food, either by souring or the growth of mould. In either case the worms will not eat and so are starved. The remedy is to give only sufficient to last for two days at the most in warm weather and to remove at once any tainted food.

The second danger is the invasion of flies, especially the large "Blue bottle" variety. They are only likely to attack the food if it is sour or mouldy and therefore the remedy is as already stated. If the flies lay their eggs in the food, the result will be swarms of maggots, which I have found to my cost not only devour the food, but the worms themselves. I have lost the whole contents of one very well-stocked box from this cause. Luckily I had other boxes which had not suffered in the same way, or it would have meant starting all over again from a fresh culture. The remedy in this case is to cover the box itself with a sheet of glass which fits over the top so that there is no means of entrance for the flies.

The introduction from time to time of some more leaf-mould, rotting leaves, or old manure helps with the feeding and fattening of the worms. If inadequately fed they will remain small and thread-like, but with plenty of food they increase in size as well as numbers and should provide a constant supply all the year round, for both tropicals and Goldfish.

Pond and Stream Life

New Book by John Clegg, F.R.M.S., Now Ready

AN addition to the popular "Water Life" Series of books is No. 10, entitled "Pond and Stream Life". This has been written by Mr. John Clegg, F.R.M.S., Curator of the Haslemere Educational Museum and author of "Aquatic Insects" (No. 6 in the same series).

This new book will prove of interest to all readers, particularly those who like to be able to identify the many creatures to be found in our native fresh waters. It will be a helpful guide to students young and old and has been especially designed to explain not only what the creatures are but how they are interdependent and how they can be identified.

Mr. Clegg introduces the subject by setting out his object in writing the book and rightly mentions that there is need for a publication of this nature, which provides a general survey of aquatic life, yet devoid of as many technicalities as possible. A short review is given of the conditions obtaining in ponds and similar stretches of fresh water, after which the author goes on to deal with numerous forms of life supported in them.

Under "Microscopical Plants", the action of bacteria and fungi are considered and the groups of algae described. From here we are taken to a chapter covering the simplest animals, such as the flagellates, rhizopods, ciliates and sporozoans.

Sponges and Hydra are covered and further chapters are devoted to "Flatworms, Roundworms and Segmented Worms", "Rotifers", "Most Animals or Polyzoa", "Animals with Jointed Limbs", "The Molluscs", and, finally, notes on collecting and examining specimens. The book is profusely illustrated with photographs by the author and its perusal will do much to show what a wealth of life exists wherever natural areas of fresh water are to be found. To those who like to learn more about Nature in an easy way and who want to be primed before they go pondhunting, this new book is just what is wanted to introduce them to a fascinating subject.

To quote the author's summing up:—"It need hardly be said that the keeping of the smaller denizens of our ponds in tanks opens up exciting new fields for the aquarist. In studying the behaviour of the creatures, their development and other features of their biology, the aquarist can learn a great deal of the world of nature and provide himself not merely with an absorbing pastime, but one in which work of scientific value can be undertaken".

This new publication can be obtained through newsagents, price 2/- or from the Publisher, WATER LIFE, Dorset House, Stamford Street, London, S.E.1, price 2/2d including postage. It has an attractive cover, the photograph reproduced being one of the pools in the grounds adjoining the Haslemere Museum where studies similar to those outlined in the book are carried out by students who attend the instruction courses run in connection with the Museum.

Judges and Their Responsibilities

Mr. J. Brunning Gives His Summing-up

EXACTLY one year ago, I put forward views on the practice whereby some judges withhold first prizes on the grounds that the fish in the classes before them are not worthy of the card.

A large number of opinions were sent to *WATER LIFE*, a selection of which have been published. I have also been shown those which had to be left out, owing to lack of space. I had not expected that my protest would have engendered so much feeling.

It is apparent that the attitude towards the right of withholding prizes depends very largely on whether you look at it as a judge, an exhibitor or a show promoter. There are various shades of opinion within the three groups.

It seems obvious that the judges are not all of one mind on the matter. Their different ideas depend, I suggest, on whether on one side, they, as judges regard their judging appointments as engagements which make them temporary servants of the show organisers or whether, at the other extreme, they believe they can lay down their own ideas on a judge's responsibilities, whether or not such views clash with the show rules. And there are those who sit on the fence in this matter.

In general, our judges are a hardworking lot of enthusiasts who, having the right temperament and a thick skin, cheerfully give up their time to travel to shows and take on the thankless task of selecting winners. If it were not for their keenness they would not do the work. Even so, I am not sure that that excuses the attitude a minority take up.

New Judges Coming Forward

It must be borne in mind that there is not only the core of old hands at the judging game but also the up and coming aquarists who can in many ways make as good a job of judging as can those who have been at it for a number of years. I feel that some who have long been in demand for their services, having had little to guide them in the pioneer days, have built up their approach on their own ideas of what are good or bad fish and, with no standards to hold against them, they can make decisions which it is difficult to dispute since, there being no published ideals, their word is as good as the exhibitor who disagrees with their placing. I, for one, want to see more standards put forward.

We have, in effect, two main classes of judges. One group says "We are asked to judge these fish and we do so with a view to placing them in the correct order, awarding prizes accordingly." Others say "Whilst we come here to judge the fish in front of us, we must bear in mind those put before us at other shows. Here we have only a secondrate lot and, as they do not come up to the standards (i.e., those of the Federation, etc., where they exist or those of our own imagination where they do not), we shall dictate how many prizes are to be given". There are those who fall into neither group but try to compromise between both points of view.

How do the exhibitors feel about the suggestions I originally put forward? It is thought by a number of them that, having decided to support a show, they should not have their time and money wasted because a judge has, rather high-handedly, they feel, refused to award a card on the ground that the standard is low. They feel that a judge exercising such discrimination is either going too far or, alternatively, is taking the wrong attitude over the basis of awarding prizes. Their prime object in showing fish is

to see if they can beat others who put down specimens of the same or a similar species and if they are, to a minor extent, pothunters, it is because there is more incentive to show when cups, trophies and diplomas are offered. If, by the luck of the game, they say, the better fish, as always, are kept at home, then it is the duty of the judge to award the prizes in order of merit to such fish as are entered. Withholding prizes would be all right, they argue, if it were a generally accepted practice in the hobby and if there were universal standards for all fish. Without such provisos they are, on the whole, of the opinion that a judge has no right to deprive them of the prizes for which they compete.

If a show is held in an area where few societies exist it is conceivable that support will come from a large number of individual fishkeepers who have not gone in for breeding on a large scale. Their fish may not equal in standard those bred at the shows in districts such as London, Manchester, Birmingham, Nottingham, Bristol, etc., where exhibitors have been accustomed to higher standards obtaining amongst the prizewinners. The fact that a backward area can only produce, at present mediocre specimens in the opinion of the judge, does not in my view, justify holding back the awards which the promoters offer. The judge is officiating at one show at a time and not acting on behalf of any one national organisation to determine which fish throughout the country comes into the prospective categories of a First, Second, or Third prizewinner, etc.

Why Shows are Promoted

Those who promote shows, i.e., the show committees of a large number of our societies, look at the problem in another light. Why do they put on these events? One reason is to make money for the club's funds, though from the adverse balance sheets of several shows during the past year, one gets the impression that show promoting is fast becoming a liability. Another is the far-seeing policy of providing a means of publicising the hobby. A third is to encourage aquarists to keep only good stock, realising that they will be more likely to do so if they can have shows at which the true value of their fishes can be assessed.

They spend many hours behind the scenes, sacrificing time and labour, to stage a show. They try to offer a good schedule of classes and accompanying prizes so as to draw an entry not only sufficiently strong numerically to cover the cost of the prizes but of as good quality as the competitors can stage. One of their first tasks is to engage the judge or judges. They want him or them to decide in which order the best fish in each class come so that they can give the prizes to the rightful claimants among the exhibitors. No more and no less. I cannot do other than strongly agree with the opinion expressed that if show organisers offer money and other awards to competitors who pay an entrance fee, it is their responsibility to the aquarists supporting the show with entries to see that their part of the contract is fulfilled. They have the undoubted right to tell the judges they engage that they require them to award all the prizes in order of merit.

It may not be known to all, but there is the tendency among some judges to take up the attitude that they and not the show promoters should dictate the conditions under which they are to do their work. I hope that all show organisations will reserve the right to expect the judges to conform with the show rules, only recognising that a judge's decision is final if within the spirit of those rules. I am quite sure that with reasonableness prevailing, judges and promoters, on the whole, will agree that this is by far the best method to adopt.

If I enter a show for which prizes are offered, I expect those prizes to be awarded, unless the show rules make specific reservations under which any of the awards can be withheld, such as a sliding scale of prizes according to the number of entries received. I look to the judge to point all the exhibits and to award all the prizes the rules permit

(Continued on page 329.)

ATHING of beauty and a joy for ever! Yes, a furnished aquarium can be all that and it can provide interest and restfulness as well. It is because of all these reasons that clubs set up furnished aquariums in many hospital wards and, as a result, give untold pleasure to the sick and suffering.

The furnished aquarium has risen in the aquatic world since the days when it was known as the balanced aquarium. Although it has changed its name it is still, or should be, in fact, a balanced aquarium. It graces the hospital ward, living rooms, waiting rooms, public bars—and even bath-rooms—but no matter where positioned, it is a living picture. This living picture is a scene predominantly green in tone, but into which may be blended browns and reds, and finally it may be enhanced by the addition of the glittering and jewel-bedecked inhabitants.

Plants of Varying Colours

The green tones are the living plants which can be offset by the use of plants having reddish-brown and red foliage and, if we wish it, suitable rock formations to give a balanced appearance. For the fish we have dozens of various shapes, sizes and colours from which to choose. Some of them are bound to be in keeping with the picture which we are trying to create.

At one time the furnished aquarium was set up at a show as a set-piece, or in the fishhouse because it looked attractive, but it was realised that this attractiveness could be utilised in other directions. Tanks were set up in living rooms because they added a touch of brightness. They were recommended by the medical profession for tired and nervous cases because there was always an appearance of serenity which was encouraged by the slow movements of the fish. The person sat and watched the fishes and was thereby resting and thinking of other things than his own illness. Then, at shows, it was appreciated that the furnished aquarium offered scope to an exhibitor in many ways because, to form this living picture, many considerations had to be successfully combined.

Combination of Factors

Firstly, it showed his ability to grow plants, because the picture needs well-grown plants; secondly, the fishes had to be well chosen both for colour and harmony and that would show his ability to keep and grow on fishes to perfection.



Photograph [P. M. Goodchild] A more garish effect is permissible in marine furnished aquaria where Anemones, coral, seaweed, shells, crustacea and fish may be introduced. This tank was shown in a recent display by Kings Lynn A.S. which was visited by H.M. the Queen.

When Setting Up

The Various Considerations Explanation of the F.B.A.

By C. W. G.

Lastly, and most important, it showed his adaptability in choosing, blending and arranging the plants, rocks (if used) and the fish in order to show his artistic ability. So the exhibitor became a genius in his own field. The exhibition of furnished aquaria ranks alongside an art exhibition. One is an exhibition of living scenes transcribed into still pictures, surrounded by a frame, whilst the other is an exhibition of living things, brought together to form a living picture, within the framework of the aquarium.

As I have already said, the setting up of a furnished aquarium displays the prowess and ability of the individual but there are several essentials that everyone must be able to carry out in order that the winning of a red card in a furnished aquaria class may be a possibility. These essentials must also be borne in mind when setting up furnished aquariums in our own homes.

Firstly, the aquarium glasses should be perfectly clean, all smears and stains must be removed before commencing work on the tank. If this cleaning operation is left until after the setting up, plants may easily be disturbed.

The compost should be thoroughly washed, so that if water were to be poured directly on to the sand no discoloration of the water would take place. The sand should be well chosen so that it blends with any rockwork which may be used.

Choosing the Rockwork

Rockwork should be of a suitable size, that is, not too large so that it takes up essential swimming space, and if more than one piece is used, these should be well balanced. The rocks should be free from sharp edges (because they might cause injury to the fish) and also free from small holes that might collect uncaten dried food and thereby sour the water.

The water should be clear and bright; it is surprising how bright water enhances the appearance of the plants and fish. In fact, clear water puts life into the picture just as a coat of varnish adds that finishing touch to the artist's painting.

The plants should be well grown and



Photograph An original furnished aquaria layout - show of the Scottish A.S. Plants used Amazon Sword Plants and Indian

Pointing to

Selection
Size
Quality

Selection
Quality

Permanence
Originality
Realism
Harmony

Clarity
Rockwork
Planting
Compost
*Credit will
rock when

The above
competitors
on the job
Federation



The Editor is [not] responsible for opinions expressed by correspondents.

ADAPTABLE "CREEPING JENNY"

SIR.—Where difficulty is met with in obtaining suitable water-plants for aquaria, readers might well use *Lysimachia nummularia*, the well-known "Creeping Jenny" of our gardens.

Choose suitable lengths of this plant according to the depth of water in your aquarium and attach a small lead weight at one end to prevent it from floating on the surface. Roots will soon appear at the various joints and, as the plant grows upward above the water level, it is most attractive and not in any way liable to decay.

I have used it in my aquaria for years, renewing the supply each autumn, and in every way I can recommend its use.
Balfour. D. M. KAY
Glasgow.

NATIONAL CHAMPIONSHIPS

SIR.—"It is a pity the show is so far away, otherwise I would have entered my fish". This quotation in the first paragraph of Mr. J. P. Keene's article in the October issue of *Water Life* emphasises the inherent weakness in his suggestion for a national show made up of prizewinners at regional events in order to discover national champions. The quotation indicates that the exhibitor making such a remark has a certain amount of confidence in the quality of the fish withheld because of distance alone. The fish may well have been awarded firsts in local shows of good standard.

It seems that the travelling distance remains the main stumbling block. I consider that the suggested adoption of a condition of entry at regional shows that winners must be entered for the proposed national show will have the effect of limiting entries at the former to those competitors who are prepared to send or take their fish to the latter. It follows that the ultimate winners of championships will not then necessarily be the best fish in the country and the object of Mr. Keene's suggestion would therefore be defeated.

If it is desirable to find national champions, this could best be achieved by rigid pointing at regional shows, returns of the results being made to the F.B.A.S., the awarding of championships being made to the fish gaining the highest points in each class after every regional show has been held.

This suggestion would have obvious difficulties but some of them could be overcome by promoting county or area shows, led up to by borough or local shows, which would be held for residents only, on different days for each county or area over a period of a month or more. By this means, the same judge could judge his particular class or classes at every regional show and thus the difficulty of pointing by different individuals would be overcome. Each county show secretary would then make a return of county champions, and their points, to the F.B.A.S. and the records would finally show the fish which had gained the most points in each class. These would be declared National Champions. By this method, joint holders of championships would be a possibility but this is not necessarily undesirable. The same arrangements could extend to plants and furnished aquaria.

National championships could thus be awarded without involving owners in sending regional winners to a special championship show, and entries would not be so limited. Furthermore, the risk of change of condition of a fish between

the dates of the county show and a national event would not arise.

National shows could still be held on a competitive basis but, as fish eligible to compete for the honour of national champions would already have received prizes for their achievement, and in any case their entry would limit others, they should not compete with other entries. The owners of the county champions should be invited to exhibit at the selected national show in a separate class, and to maintain interest, a panel of judges could be appointed to select a champion of champions.

I have confined my remarks to the broad outline and a great deal of thought and work would be needed to adopt this suggestion, but from what I have seen of the work of show secretaries this would be well within their compass.

London, W.1.

H. A. LOCKE.

SIR.—I am most pleased to see the question of championship shows raised in your columns as I have felt for some time the advisability of such a venture. One point which must always be kept in mind is that it is the fish that gain the championship awards and not the exhibitors.

Should such a system as outlined by your contributor, Mr. J. P. Keene, come into force, it would then be possible to pedigree our stock, a development that I think is most desirable, if not essential, to the furtherance of high quality fish breeding.

If the Federation of British Aquatic Societies would take the matter in hand and arrange regional shows, I feel that it would be one of the greatest steps forward ever made to ensure progress in our hobby.

Mathull,
Lancs.

A. R. THOMPSON.

SELECTIVE BREEDING

SIR.—With regard to the letter in the June issue of *Water Life* from the pen of Mr. Baldry, I must say that in my opinion, selective breeding of Platies of inferior stock can only result in an improved strain *given time*—by using only the best fishes of each brood. As all followers of selective breeding will know, one cannot at first forecast exactly what standard of quality the young will be, and it does happen that fish of very much better quality than the parents can result from matings in the early stages of line-breeding. By choosing the best of these one can definitely improve the strain. How else were the first-class Platy strains bred in the first place? How else was the Black Sailfin Mollie strain produced? Surely the fish used at the start of the experiment to produce these better quality fish could be termed "inferior" when compared with the "finished product"?

Incidentally, the perfect answer to your previous correspondent, Mr. Nichols, was made by Dr. Myron Gordon in a recent issue of an American aquarium journal on the subject of hybridising Platies. No doubt your reviewer of magazines will deal with this in due course.

T. C. SAVILLE.
Nottingham.

CALCULATING TANK CAPACITY

SIR.—The set of questions and answers comprising *Water Life* Quiz No. 2 refers to a 24 in. x 12 in. x 12 in. tank holding 12½ gallons of water. That calculation is faulty.

A tank of those dimensions will hold a smaller amount as the following will show. The external measurements are invariably quoted and if one allows ½ in. for the thickness of the frame, ½ in. for putty, another ½ for the glass sides, ½ in. for the bottom, and bear in mind the fact that the water level is usually ½ in. below the top of the frame, the measurements to be used for determining the volume of water is 23½ in. x 11½ in. x 11½ in., which, if my arithmetic is right, amounts to 9.933 gallons (or less if the sides and ends are of ½ plate glass). That, however, is not the complete answer because the presence of compost and rocks mean still less water.

Why do we want to know the volume of water in an aquarium? Surely not just to prove that we know the formula of "One cubic foot of water equal six and a quarter gallons", but because it has some bearing on the subject of balance in the tank, and, more important, that we should be able to determine the exact amount of any substance which we desire to add to the water to produce a solution of a certain strength to combat pests or diseases. It is the volume of freely circulating water above the compost and rocks that determines the strength of this solution. The water amongst the compost circulates so slowly that it can be ignored.

My method of determining the volume of water is to wet a piece of paper and stick it on the front of the glass, lower the

level of the water to a point near the bottom of the paper and make a mark, then add water by measurement and make another mark. By measuring the distance between the two marks the exact volume per inch in depth of water can be ascertained and permanently recorded. Thereafter, the amount of water above the compost can be determined, irrespective of the level of the water in the tank, by measuring the number of inches above the compost.

We now have about 8 gallons of water to deal with instead of a supposed 121 gallons and we know how to determine the amount of water in any tank. When we deal with treating sick fish, we have not got the complete answer unless we are certain that the authors of "One drop to the gallon, etc." are NOT working to the rule of 24 in. = 12 in. = 12 in. = 121 gallons. We should, therefore, read their instructions very carefully and proceed with caution when such loose terms as "A 12 gallon tank" are used.

Chatbam,
Kent.

C. C. L. DAVEY
Medway Aquarists Society.

BRISTOL'S REPLY TO CAPT. BETTS

SIR.—After careful reading of the article by Capt. L. C. Betts under the heading "Bristol's Challenge Taken Up" in the October issue of *Water Life*, one is left wondering whether the author is leg-pulling, as many statements are quite contrary to what he has previously written.

The Bristol A.S. has not made a further revision of the B.A.A. Standards as he states. This is the first, and therefore a fourth set of Standards have not been created, as he suggests.

Capt. Betts, in expressing doubt as to the correctness of the three sets of Standards (viz. B.A.A., F.B.A.S. and G.S.C.B.I.) does nothing but strengthen Bristol's case, and confirms the contention expressed by the Bristol A.S. that all the new standards launched were unnecessary. Let us therefore wait until posterity judges the originals to be wide of the mark.

Concern is expressed with the terms "scaled" and "scaleless", but he should not worry too much about this. These terms, as used by the B.A.A., are, perhaps, misnomers since, as aquarists know, all Goldfish are scaled, but the ordinary aquarist (and he forms the backbone of the hobby) is concerned with visibly scaled and harlequin coloured ones. Therefore, as far as standards for show purposes are concerned, why bother about the third group?

The Moor is telescopic-eyed and true breeding, but the telescopic-eyed Veiltail, being a mixed form, is undesirable according to Capt. Betts. Bristol's attitude, however, is to advocate breeding to types of wide variety, and not a selected few, chosen without universal approval.

The Nymph is described by him as a single-tailed Veiltail,

When Setting Up a Furnished Aquarium

(Continued from page 317.)

Under the fourth section we start with Clarity and this is where careful preparation beforehand counts. Next is Rockwork and this brings into consideration the exhibitor who has set his picture to either embrace rocks in his design or set a design needing no rocks. If they are used, suitability, as explained earlier, would be considered.

Third in this section we have Planting. The roots should be covered; the plants planted naturally and no weights left showing, etc. These are just a few of the items to be remembered.

Lastly Compost must be considered. Is it well arranged, well selected to blend with rocks (if used), suitable for growing plants (i.e., does not pack too tightly), unsuitable for aquarium use or too open and therefore likely to allow food to percolate into pockets and so set up decay? Possibly in Nature sand and rocks may be seen that do not blend as the result of being carried downstream but we are artists in our own sphere, or strive to be, and we may therefore leave out, or add to, the natural scene in order to improve the appearance.

The furnished aquarium, whether for the living room, hospital or for competition or exhibition, becomes the living expression of the individual who, by his ability, arranges and re-arranges the plants and rocks until he produces his living picture. The completed work is then "hung" for all to see and admire or criticise.

but a round-bodied fish with a twin Nymph-like tail, would hardly pass as a Veiltail. Good Nymphs are as rare as good Veiltails, and the statement of "pandering to a popular demand" is, I am afraid, very wide of the mark.

Criticism of the pointing values is of minor importance. We were, of course, fully aware of these shortcomings, in fact it was agreed that new pointing was overdue. Capt. Betts thus agrees on this angle.

The Bristol A.S. has never at any time thought the B.A.A. to be the last word on any aspect of the hobby and, in creating the Bristol Shubunkin, I think he will admit that a "fillip" was handed out to the hobby. Nothing to approach this beautiful creation has been conceived in the coldwater fish fancy since then, or is even likely to be for a long time. The observation of improvement in the quality suggests consistent breeding of the types with the factors present, and was based on post-war exhibits as a whole—quite apart from judges' placings, which might have been good, or not so good.

Capt. Betts wants an answer to a million-to-one chance when he asks for adjudication between a three-coloured fish intensely pigmented and a five-coloured fish of poor intensity. Based on 35 points for colouring, this leaves 64 to be allowed for body tail, fins, gill plates and style and type. He is suggesting, therefore, that two fish on the same bench qualify for identical marks which, of course, is extremely unlikely. The time has not yet arrived for a directive to be issued on HOW colour takes precedence. The standard specifies ground colour to be blue with four other colours present in the perfect fish, including red. Capt. Betts says he is informed on the highest authority that a Goldfish with red colouring has yet to be seen, but that the nearest approach so far seen is orange.

That, however, was not his opinion when writing in February, 1948, *Water Life*, for does he not state there, speaking of the Common Goldfish, "The recognised colour . . . is red, as deep and rich as possible"? In his book "The Goldfish" he writes that "the usual colouring is deep red of a metallic hue". It all depends on one's eyesight, but I can assure him that he can see a dozen or more blood-red Common Goldfish in the Bristol Zoo Aquarium. Incidentally, this statement of Capt. Betts has caused considerable amusement. As we were not able to consult the "highest authority", we approached a member of the medical profession, an optician and an artist, and we can give him the assurance of these people that the colour red, as we are taught to know red from childhood, does occur in the Shubunkin.

The so-called ambiguities of the Bristol Shubunkin specification are extremely flimsy inasmuch as the description must be read in conjunction with the line drawing. Capt. Betts would hardly expect a builder to erect a house without a plan. As regards a normal Shubunkin eye, if he has seen, as I have, a tank teeming with telescopic-eyed, single-tailed fish, he would realise what a "normal" eye means. I am sorry that the specification has left Capt. Betts so undecided as to the conception of this fish. If he has felt this way about it, I would suggest that he should have communicated with the Bristol Society for further amplification. It is most surprising that he has undertaken the judging of these fish in such an uncertain state of mind.

As to the uncertainty regarding length and breadth of fins, we are informed by Capt. Betts, in February 1948, *Water Life*, in reference to pectoral, pelvic and ventral fins, that they are



Photograph

F. 11

Youngsters at The Fulham Nursery School show interest, and even lend a hand, as the water in a Goldfish aquarium is changed.

short in a Common Goldfish, might I ask him therefore, how short is "short"?

His attack on the Bristol Shubunkin Standard shows an entire change of attitude, for it is Capt. Betts who writes in "The Goldfish" . . . "in recent years some fanciers in Bristol have put in some very fine work and evolved a strain which is known as the Bristol Shubunkin. The difference in standard is that the tail is broad and full, of medium length, and carried stiffly". The B.A.A. Standards, too, are described in, February 1948, WATER LIFE as being "ideal", insofar as the Common Goldfish, Comet, and Nymph are concerned.

It is interesting to note that the F.B.A.S. are at present reviewing their standards. The G.S.G.B. Standards are available for those who prefer them, so perhaps Capt. Betts can induce that body to adopt the basic four.

The Bristol Aquarists' Society are offering nothing new in the way of standards. There is no necessity for this. Revision of the B.A.A. Standards was long overdue and, as no organization appeared willing or capable to undertake this task, the members of the B.A.S. and the South Western Aquarists' Societies Association (representing around 1,000 active fishkeepers) decided to do so.

This then, is the position. The announcement of Bristol's action has already brought forth requests from New Zealand and Australia, with a view to adoption, so that the course taken is bearing fruit before actual publication. Where it will lead, I cannot say, but quite definitely the B.A.S. have no intention of thrusting its ideas on anybody. It will be left to the aquarists to choose between what are tantamount to easily the more pleasing types of wide variety, and a few types created without any consideration whatever for the aesthetic.

Bristol, 4.

R. V. COOMBS,
(Secretary, Bristol A.S.)

BUBBLES AND "BENDS"

SIR.—In my opinion, Mr. K. M. Smith's explanation of "bends" in fish in his article in the October 1951 issue of WATER LIFE is nonsense. The variation of pressure due to that of density with temperature, in, at any ordinary depth and temperature variation, no more than a fraction of an inch of water; yet in the descent from the surface to the bottom of a small tank a fish experiences as much as twelve inches of water pressure change in a second, and completes the return journey in the same time without "bends".

It may also be noted in connection with this article that air driven from solution by a rise in water temperature commonly forms bubbles on fins in the same way as on the sides of the tank and the buoyancy effect of these is quite capable of upsetting the "swimming control" of the fish.

Faversham,
Kent.

C. W. THOMAS.

SIR.—Most of us have at some time or other observed bubbles of gas on our fish when there has been a fairly large, sudden rise in water temperature. The explanation of the mechanism of this phenomenon by Mr. Smith in his article on "Effect of Light and Heat on Shubunkins" (WATER LIFE, Oct. 1951) belongs to the realms of fantasy rather than science. He states, "The finnage of fish under such conditions appears to contain small bubbles of gas". That I feel is a wrong observation. The bubbles are on the fins and not in the fins and what is more they can be observed also on the sides of the tank, on the sand and various other paraphernalia in the aquarium. The explanation of this phenomenon which is offered is that this condition is produced by a drop in pressure due to a lowered density of the water produced by a rise in temperature. Such an explanation does not take into account the fact that, due to the rise in temperature, there will be expansion of the water, resulting in turn to a greater height of water in the tank; a fact which will tend to counteract the tendency to pressure diminution at any given point in the water. Besides, even if there were a slight diminution in pressure, surely the fish could easily compensate this by swimming at a slightly deeper level.

However, all this is rather irrelevant to the main problem, for it is well known that to evolve bubbles of gas in the blood stream, as in Cluison's disease (popularly called the "bends") to which Mr. Smith compares this condition, large and sudden reductions of pressure are necessary. The fact that a fish can rise from the bottom of the tank to the water surface without "bursting into bubbles" (a feat which would obviously create a far greater reduction of pressure on the surface of the fish than any that could possibly be obtained by a reduction of density following a rise in temperature) should convince anyone that small differences of pressure are of no importance.

The true explanation of this phenomenon is, I think, both simple and well-known. Cold water can hold far more gas in solution than warm water. When the temperature of the water in a tank rises suddenly, due to any cause, the warm water cannot then retain the original volume of gas that was present in it in solution when it was cold. Hence this surplus gas is thrown out of solution and appears as bubbles on the surface of all sorts of objects, both animate and inanimate, for these provide the necessary nuclei of condensation for bubble formation. The appearance of these bubbles does inconvenience the fish, but contrary to Mr. Smith's statement, I do not feel that they are either dangerous or likely to prove fatal.

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Department of Pathology,
The University,
Sheffield, 10.

F. N. GHADIALI,
M.D. (Lond.)

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In fact, however, a temperature rise does not produce any change in pressure, because the increased depth of water arising from expansion exactly neutralises the decrease in density (actually the expansion of the water causes the decrease in density).

The pressure at any point in a tank depends on two things only, (1) the weight of water above the point and (2) the barometric pressure of the air around the tank. The former is entirely independent of temperature and the latter only very remotely related.

In any case it is clear that in swimming normally from the bottom of even a small tank a fish undergoes, without ill-effects, a much larger and more rapid change of pressure than can arise from atmospheric conditions.

It is true that the amount of gas (air, carbon dioxide, etc.) that can be dissolved in water varies with pressure (as witness the soda-water syphon), but it also varies with temperature quite independently of pressure and I suggest that it is entirely the latter effect which causes bubbles in the body-fluids of a fish when temperature rises rapidly.

Birmingham, 20.

G. JACKSON,

MR. CARNELL'S CONSISTENCY

SIR.—After reading the remarks in the August-September issue from Messrs. Carnell, Creed and McLeod—in which they ask "for the names of disgruntled aquarists no longer content with the inconsistencies of judges", it so happened I was sorting a few prize cards. My best three were for a *Panchax lineatus*. These awards were a Diploma at last year's Olympia show, a First at the Belle Vue event and a Certificate from Hendon A.S. Open Show. Each time the same fish was shown and each show was miles away from the others.

Suddenly, too, I noticed in each case that the judge was Mr. Carnell! Maybe judges have faults but certainly I would not say that inconsistency is one of them.

Edgware,
Middlex.

B. CALROW,
(Assistant Show Secretary, Hendon A.S.)

Mr. J. Brunning Gives His Summing-up.

(Continued from page 315)

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I am still of the opinion that to withhold prizes is wrong.

short in a Common Goldfish, might I ask him therefore, how short is "short"?

His attack on the Bristol Shubunkin Standard shows an entire change of attitude, for it is Capt. Betts who writes in "The Goldfish" . . . "in recent years some fanciers in Bristol have put in some very fine work and evolved a strain which is known as the Bristol Shubunkin. The difference in standard is that the tail is broad and full, of medium length, and carried stiffly". The B.A.A. Standards, too, are described in February 1948, *WATER LIFE* as being "ideal", insofar as the Common Goldfish, Comet, and Nymph are concerned.

It is interesting to note that the F.B.A.S. are at present reviewing their standards. The G.S.G.B. Standards are available for those who prefer them, so perhaps Capt. Betts can induce that body to adopt the basic four.

The Bristol Aquarists' Society are offering nothing new in the way of standards. There is no necessity for this. Revision of the B.A.A. Standards was long overdue and, as no organisation appeared willing or capable to undertake this task, the members of the B.A.S. and the South Western Aquarists' Societies Association (representing around 1,000 active fishkeepers) decided to do so.

This then, is the position. The announcement of Bristol's action has already brought forth requests from New Zealand and Australia, with a view to adoption, so that the course taken is bearing fruit before actual publication. Where it will lead, I cannot say, but quite definitely the B.A.S. have no intention of thrusting its ideas on anybody. It will be left to the aquarists to choose between what are tantamount to easily the more pleasing types of wide variety, and a few types created without any consideration whatever for the aesthetic.

R. V. COOMBS,
(Secretary, Bristol A.S.)

BUBBLES AND "BENDS"

SIR.—In my opinion, Mr. K. M. Smith's explanation of "bends" in fish in his article in the October 1951 issue of *WATER LIFE* is nonsense. The variation of pressure due to that of density with temperature, is, at any ordinary depth and temperature variation, no more than a fraction of an inch of water; yet in the descent from the surface to the bottom of a small tank a fish experiences as much as twelve inches of water pressure change in a second, and completes the return journey in the same time without "bends".

It may also be noted in connection with this article that air driven from solution by a rise in water temperature commonly forms bubbles on fins in the same way as on the sides of the tank and the buoyancy effect of these is quite capable of upsetting the "swimming control" of the fish.

Faversham,
Kent. C. W. THOMAS.

SIR.—Most of us have at some time or other observed bubbles of gas on our fish when there has been a fairly large, sudden rise in water temperature. The explanation of the mechanism of this phenomenon by Mr. Smith in his article on "Effect of Light and Heat on Shubunkins" (*WATER LIFE*, Oct. 1951) belongs to the realms of fantasy rather than science. He states, "The finnage of fish under such conditions appears to contain small bubbles of gas". That I feel is a wrong observation. The bubbles are on the fins and not in the fins and what is more they can be observed also on the sides of the tank, on the sand and various other paraphernalia in the aquarium. The explanation of this phenomenon which is offered is that this condition is produced by a drop in pressure due to a lowered density of the water produced by a rise in temperature. Such an explanation does not take into account the fact that, due to the rise in temperature, there will be expansion of the water, resulting in turn to a greater height of water in the tank, a fact which will tend to counteract the tendency to pressure diminution at any given point in the water. Besides, even if there were a slight diminution in pressure, surely the fish could easily compensate this by swimming at a slightly deeper level.

However, all this is rather irrelevant to the main problem, for it is well known that to evolve bubbles of gas in the blood stream, as in Caisson's disease (popularly called the "bends") to which Mr. Smith compares this condition, large and sudden reductions of pressure are necessary. The fact that a fish can rise from the bottom of the tank to the water surface without "bursting into bubbles" (a feat which would obviously create a far greater reduction of pressure on the surface of the fish than any that could possibly be obtained by a reduction of density following a rise in temperature) should convince anyone that small differences of pressure are of no importance.

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(Continued from page 315)

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FOR YOUR BOOKSHELF

Christmas Gifts*

WHAT to buy the youngster who has risen above, in his own estimation, the usual run of toys and yet is hardly old enough for adult gifts is always a problem at Christmas time. Something which is of a reasonable price and which will give satisfaction to a child between 10 and 14 years of age is required and a London publishing concern seems to have found an answer by producing a "Modern World" series of books of which we have two before us, "Book of Hobbies" and "Book of Nature". Both are priced at 9.6d. and, produced in up-to-date style with readable text and very fine illustrations, they seem remarkably good value.

In the "Book of Hobbies" some detailed information is given on setting-up and maintaining coldwater and tropical aquariums. In a small compass all aspects are covered in a manner which should ensure that the aspiring

young aquarist starts along the right lines. Other pastimes given space in this volume are too numerous to list but if chemistry, cooking, archery, puppets, sailing, horsemanship, reading and cycle speedway are mentioned some idea of the scope of this book can be visualised.

"Book of Nature" would make an informative addition to the library of a young naturalist and in it there is very good coverage of aquatic subjects. Of the fourteen chapters some seven make extensive mention of aquatic insects, amphibia, reptiles, fish, sea anemones, crustacea etc. One caption to a photograph suggests that the Telescopic-eyed Veiitail is a denizen of the sea. This is an unfortunate error in what is otherwise a useful and attractive book.

*"The Modern World Book of Hobbies", 160 pages plus eight coloured plates. Price 9.6d. "The Modern World Book of Nature", 160 pages plus eight coloured plates. Price 9.6d. Both books are published by Messrs. Sampson, Low, Marston & Co. Ltd., 25, Gilbert Street, London, W.1.

Pond Algae for Breakfast?

AS aquarists, we have looked upon algaic development in our ponds and tanks as something of a nuisance. Those of us who have dabbled in the study of the many different kinds, especially with the aid of a microscope, have been intrigued by the beauty of form that has been disclosed. Few of us outside those with specialised knowledge, however, have appreciated that algae may have a high food value.

Mr. J. Marshall Hay has drawn our attention to a recent issue of "Food Manufacture", which reports progress in this direction. To utilise algae for food production, it is necessary to remove them from the pond and put them where their growth and multiplication rate can be greatly increased.

Supply of Inorganic Chemicals

Dr. J. F. Meyers, Director of the University of Texas Algal Laboratory, has successfully employed a process involving the use of two narrow glass tubes, one inside the other; in the narrow space between the tubes he grows *Chlorella* in water. Carbon dioxide is bubbled through the water and dissolved minerals are supplied. For each gallon of water, Dr. Meyers grows half a pound of algae; in a pond as much as 50,000 gallons would be required to produce this rate of growth. The problem has largely been the creation of satisfactory growing conditions for high concentrations of algae in thin layers of water; in the pond, the algae form a surface layer or scum on the top of a large volume of water.

Future Possibilities

If this small experimental apparatus can be transformed into a factory-scale plant, the next phase will be to convert the "crop" into food. It is believed that algae will at least provide animal food and may be used in the production of oils or fats.

(Continued from previous column.)

Red Swordtails. This was achieved by crossing a male Rubra Platy (males of this variety were red and females, brown; both were spotted with black) with a Green Swordtail female. The hybrids so produced were attractive, many being brightly coloured and heavily spangled. Most were sterile but a Mr. John Silver possessed a fertile specimen which lacked the black spotting. This was probably mated to a pure Swordtail and the progeny were of a superior red colouring and had a body shape more like that of the typical Swordtail. These were the original Red Swordtails.

The Golden Wagtail Swordtail was produced by pairing a Comet Platy to a wild Swordtail and later, with a Golden Swordtail. Then the Golden Wagtail Swordtail was crossed with a Red Swordtail. Products of this cross were selectively bred and inbred to develop the Red Wagtail Swordtail as we know it today.

CONTEMPORARY PRESS COMMENTS

Reviewed by I. W. Ashdown

NOT a few of us, I imagine, have experienced the fickleness of *Daphnia* when attempting to culture this livefood. If we try to breed them in small vessels such as a spare aquarium or water cistern, rather than a pond where the volume is much greater, it is often found that the reproductive rate is very rapid for some weeks or months and then numbers at first become static and afterwards diminish very quickly. From observation, this sudden cessation of breeding is not due to seasonal or temperature conditions—it happens just as often in outdoor containers during the summer months as in fishhouse aquariums at any time of the year.

Observations on this phenomenon have been recorded in the August 4 issue of *Nature* (G.B.) by Edw. Flückiger of Lund University. It was found that in cases where reproduction had practically ceased (in this instance the species was *Daphnia magna*) the specimens were completely filled with fat droplets of a pink colour and the ovaries could not be seen. The *Daphnia* were unable to absorb these unusual fat droplets when starved whereas *Daphnia* with normal fat reserves consume these when food is not available.

Experiments were carried out and the more conclusive results are of interest to aquarists. Two groups of these metabolically disturbed *Daphnia* were isolated and fed in differing ways; the first on finely dispersed egg-yolk for twelve hours a day, in addition to the normal algal food, and the second on baker's yeast for twelve hours daily in place of egg-yolk. Improvement was almost immediate in both instances and within three weeks about twenty young were being produced at every moult by each animal and fat reserves were small and of a yellow colour. *Daphnia* not subjected to either of these diets continued to possess the abnormal excessive fat accumulations and only

produced two or three young per moult. Incidentally, no males or sexual eggs were seen during the course of the experiments.

It would appear that the abnormal condition of the *Daphnia* was brought about by some food deficiency and it was relieved by the introduction of the egg-yolk or yeast. Aquarists might care to try introducing these materials to declining *Daphnia* cultures and we should be interested to hear what results they obtain.

AROUND the shows this year, it is very obvious that the Wagtail varieties of Platy are enjoying a hey-day. Certainly some really good plain Red Platies are seen but their numbers are appreciably fewer now and the Moon Platy, so popular in the immediate post-war years, is losing many of its devotees to the more distinctive Wagtail. Good specimens of both the Yellow and Red Wagtails are seen at practically every exhibition.

A variety of another species which is temporarily in the shade, particularly as far as colour is concerned, is the Red Swordtail and so the importation of Red Wagtail Swordtails a year or two ago was a healthy development as these show far better red coloration than the vast majority of ordinary Red Swords now seen in this country. In fact they throw very sharply into relief the tangerine-coloured specimens which all too frequently show vestigial Green markings. The Red Wagtail Swordtails may well help to inspire a fresh interest in the *Xiphophorus* Genus which will result in an improvement of all its varieties.

Dr. Myron Gordon gives a concise account of the Red Wagtail Swordtail's development in *The Aquarium* (U.S.A.) June number. To get the complete picture he goes back to the development of plain

(Continued foot of next column.)



GOURAMI SPECIES

Two members of the Anabantidae Family. These fish possess a labyrinth organ which enables them to take in atmospheric air. Left, Kissing Gourami (*Helostoma temminckii*), the illustration shows an Albino form. Right, male Dwarf Gourami (*Colisa lalia*). Both fish are mentioned in queries on this page.



Photographs [G. J. M. Timmerman]

permanganate of potash should complete the process and give the rockery a weather-beaten appearance. A final soaking under a running tap for an hour or so should make the material absolutely safe.

Sexing Kissing Gouramies

Can you tell me if it is possible to sex Kissing Gouramies (*Helostoma temminckii*)?—(R.H.B., Newcastle-under-Lyme).

We know of no definite method of sexing Kissing Gouramies but it is suggested that if you have a pair the fish will show this as they become adult by displaying an interest in each other. In other words it is largely a matter of sexing by careful observation.

Glazing Requirements

What thickness of glass and slate bottom would be required for a 48 x 15 x 15 in. aquarium?—(C.P., Peckham).

Forty-eight inches is rather long for an aquarium and you must make quite sure that it is properly supported all round—particularly in the middle—when you install it. If this is done and there is no whip in the frame when filled with water 1/4 inch slate would be quite adequate. Bearing in mind the length, 1 1/2 in. angle iron is necessary and 1 in. plate glass for the front, back and sides.

Deformed Fantail

One side of the caudal fin of a 1951 Fantail which I possess is stunted and curls downwards and inwards. There is a white spot where the fold is greatest. Can I remedy this before the fish develops further?—(H.V.N., Southwick).

Goldfish produce so many young it is inevitable that there is a percentage which are deformed and lacking in the ability to reach maturity. The fancy varieties of Goldfish (such as the Fantail) usually have

a greater number of these runts. There is nothing you can do to straighten the tail but, if you think the white spot is septic, it can be dabbed with a spot of T.C.P., the proprietary antiseptic. Fin deformity can be caused by calcium deficiency in which case calcium lactate tablets, broken up and added to the food, may remedy matters.

Fungus Cure

I have several fish infected with Fungus and, although I have twice cured them with salt solution, it has appeared again and the fish are now in permanganate of potash solution.—(W.H.A., Keyworth).

Fungus only attacks fish in a weakened condition. The salt treatment will remove the visible effects of Fungus but the real cure lies in building up the constitution of the fish. Chopped Earthworms are very good in this respect.

Dwarf Gouramies

May I have some detailed information on the keeping and breeding of Dwarf Gouramies (*Colisa lalia*)?—(G.F.C., N.W.6.).

For the breeding of *Colisa lalia* both fishes should be separated at first until the female appears full of spawn. Aquariums not less than 24 x 12 x 12 in. (or 12 gallons capacity) should be used and water not too new and definitely free of *Daphnia*, *Cyclops*, etc. The depth should be 5 in. A few rooted plants may be included but floating plants such as *Riccia* are essential for the male to build his nest. The temperature may be 80-85 deg. F. The male and female must be separated by a glass partition. When the male builds the nest remove the partition and await the spawning. This is very large, consisting of 100 to 500 eggs. When spawning is finished remove the female and the fry should be

free-swimming in 48 to 72 hours. Then remove the male and feed the fry continually on small Infusoria, followed by Brine Shrimps, Mikro-worms and finally sifted *Daphnia*. You can increase the water depth after the first two or three weeks, according to the growth of the fry.

Heron Danger

In the garden of my country house I had a pond which was full of Goldfish but one night they were all eaten by a Heron. I have been told that if I put wire-netting, one foot high, around the pond it would prevent the Heron getting in as the pond is very shallow.—(P.B.T., Chelsea).

Heron are extremely difficult to deal with as they work very quickly and very early in the morning. It is questionable whether a wire netting surround will be effective as some people seem to think they



Photograph [S. Crook] Where ponds are shallow, Herons may be responsible for fish losses (see reply to P.B.T.1)

WATER ANALYSIS

Samples for analysis should be sent in a clean pint bottle to Water Life Analyst, 12, Featherbed Lane, Addington, Surrey, together with a fee of 5s. per sample. The name and address of the sender and details of prevailing conditions should accompany each sample which is submitted.

Sample received from L.M., Birmingham.—Taken from a 12 x 8 x 11 ft. pond which had been in use for ten years. The fish, up to one month previous to sending the sample, had been perfectly healthy and had bred, although they did not appear to have grown to normal size. Since that time the fish had become listless and 17 had died. There was no outward sign of disease, the water was clear and the plants thrived.

Test for impurities.—Appearance: clear, faintly yellowish, satisfactory. Odour: none, satisfactory. Total mineral content

and organic matter: not enough water submitted. Nitrogen compounds: 0.000048 per cent, satisfactory. Ammonium compounds: 0.000024 per cent, satisfactory. Poisonous metals: none detected. pH: 7.0. Chlorine, as salt: 0.038 per cent, rather high

Suggested corrections: The chemical analysis of this sample of pond water showed that it was free of excessive organic polluting matter. From the sodium chloride (salt) content, and figure obtained, there would, however, appear to be an undue concentration of total mineral salts, this could not be estimated owing to the small quantity of sample submitted for analysis. Excessively hard waters, i.e., waters containing an excess of dissolved mineral salts, at certain pH values, may interfere with the oxygen intake of the fish. I suggest that the water be drained away and the pond refilled with tap water.

will catch the fish when flying. If they wade in after the fish then wire should prove a deterrent. We have had few reports of losses where the pond has had depths into which the fish could retire at night.

Inter-breeding Goldfish

Can you tell me whether a Shubunkin will breed with a Common Goldfish?—(P.J., Ipswich).

All the various types of Goldfish will cross breed with each other. It is, however, a great pity if you let them do so as the results of hundreds of years work in building up the varieties is destroyed

In and Around the Aquaria World

— By W. J. Page —

BEHIND the rather forbidding exterior of a policeman's figure, it is a relief to find that he has human interests similar to our own. Off duty, he often follows the same hobbies as we do and it is pleasing to learn that that old and respected force, the City of London Police, not only numbers a large percentage of fishkeepers within its ranks but that it has decided to form its own aquarists' society. The next time you are in the City's "square mile" and come across a constable or even a chief inspector, don't be surprised if, when he discards his uniform for a period of rest he will not be turning his attention to a newly-hatched batch of fry. Most if not all are tropical fish enthusiasts. If a constable on duty outside the Bank or Mansion House looks elated, maybe it's because he's put one across the station sergeant by breeding some Angels or even Neons while that august personage, busy filling in charge sheets or recording reports on lost property, is secretly wondering why his bardy Platies and Swordtails have refused to present him with the expected increases in their families.

MUCH has happened since Mr. R. J. Affleck left this country to take up an appointment at the new Government fish hatchery at Snob's Creek, near Melbourne, Victoria, Australia. From somewhat pointed reports in State newspapers we have seen, it would seem that the ambitious plans of the State authorities to breed huge quantities of fish on a commercial basis have not come up to expectations. I hesitate to think that here we have in miniature the equivalent of an unproductive East African groundnuts scheme or a Columbia poultry farm flop but it does seem that Mr. Affleck has been called in to give much needed advice at a time when progress has been slower than expected.

The latest setback, which caused the appearance of criticisms in the Australian press, was fully investigated and R.J.A., writing at the end of September, said "I believe I know the cause but am keeping my fingers crossed for the next three weeks while some experiments are in progress". Appreciating the trouble which "Cobber" Affleck took, when technical adviser to the Goldfish Society, in sorting out the make-up of *Carassius auratus*, I can imagine that he went to great lengths in seeking a solution to the problem. If his research has been on the right lines we may yet hear of fine native trout which grew up from Affleck alevins being offered for sale by Victoria's fishmongers.

THE news that the F.B.A.S. has decided to cease the publication of its printed bulletin will be regretted by a number of member societies. The reason for its demise is primarily one of economics linked up with the editorial policy. Right from the start, when it was issued free, it was prepared more on the lines of a magazine than a medium for reporting activities of clubs. Immediately a charge had to be made, the true demand for such a publication became apparent and, rather than



Photograph

D. F. Butler

Over five thousand people visited the recent show staged by Northampton A.S. Quite a number, we imagine, were attracted to it by the novel form of advertising the event, when the sandwichmen seen in the picture paraded round the streets wearing outdoor headpieces thus copying a carnival custom seen in South European countries.

being the hoped for money-maker, it became another drain on the Federation's slender resources. What was wanted was a monthly duplicated bulletin consisting solely of Federation and affiliated club news but even that, while fulfilling a need, could hardly have existed without being subsidised.

ONE of the teaching staff at Crescent Road Secondary Modern Boys' School, Dukinfield, Cheshire (Mr. L. Buxton) has recently established a cold-water aquarium in the school. He hopes soon to extend to tropical fish and to set up some breeding tanks. Many of the boys are keenly interested in this new activity. An aquarium society is being formed amongst the scholars as an out-of-school activity. Other schools could follow this example. Such junior societies would, in time, help to provide recruits to the adult societies and would permit the master in charge to show in practice developments that are dealt with in theory in the school-room.

A MOTION put forward for discussion at the annual meeting of the Guppy Breeders' Society shows how the scope of this specialist club has widened. Briefly, it is that the G.B.S. as such should be closed down or, rather, turned into another area society, comparable with the existing branches, but covering the London area, and that the several branch societies be controlled by a council. Its name might then be changed to the Federation of Guppy Breeders' Societies, for such it would be, with its council having a not too autocratic control over self-contained branch organisations. If the decision has been carried, it will help the several branches to feel more independent and it should not adversely affect the interests of Guppy breeders in any way. I wonder if the founder members were in sympathy with the proposition?

I referred in the last issue to the omission from the new F.B.A.S. Standards book of the current Guppy standards. Their non-inclusion will probably reflect in a bigger demand for the new G.B.S. Standards publication which, for 1951, will give 12 pages of useful information, eight of them devoted to the actual pictorial and written standards for exhibition Guppies. Certainly all who have the F.B.A.S. handbook will need the official G.B.S. publication for a complete reference to existing tropical fish standards.

THE notes in these columns on Mr. C. F. Whitehead's Veiltail with a pronounced head development which gained premier honours in the coldwater section at the M.A.P.S. show at Birmingham have drawn the following comments from that well-known aquarist:—"The suggestion made by some exhibitors at Birmingham that my scaled Veiltail was in the wrong class is interesting. With age, Veiltails, chiefly the males of course, grow the bramble on the head, but not down the neck or face. Even Moors begin to show such a development. The older they get, the more pronounced it becomes. The fish in question at Birmingham was a three-year-old Scaled Veiltail. It only turned colour this year".

Exhibitors in the Goldfish section at the leading shows will be sorry to hear that the veteran Lionhead bred by Mr. Whitehead fifteen years ago has died. During its long life as an exhibition specimen the fish has travelled about the country and been probably looked at by more people than any other single fish.

Some time ago a letter from Drs. Ghadially and Whitley was published in *Water Life* and a more recent communication says that a number of useful replies were received. They have asked for information apropos the head development in Lionheads and Orandas and their questions

have been answered by Capt. Bellis and Mr. Whitehead. They are anxious to have preserved or living specimens of Lionheads for examination and Mr. Whitehead has already offered his old-stager which has been kept in Formalin solution since it died. It has had a successful show career and now is likely to prove a help to two scientists who are engaged on cancer research. Drs. Ghadially and Whiteley would be pleased to hear from other aquarists able and willing to give them specimens, living or dead (preserved). Offers should be sent to them at the Department of Pathology, The University, Sheffield, 10.

THE proposal to inaugurate a Platy Breeders' Society looks like bearing fruit. Mr. Tom Saville of 31, Hawton Crescent, Wollaton Park, Nottingham, informs us that he has received more letters on the subject and promises of support since the proposal was last mentioned. It is planned to make a start early in the New Year. In the meantime all interested in the project are asked to contact Mr. Saville.

It is intended to send all members a questionnaire so as to gather as much information as possible on the work they have been carrying out with Platies with particular emphasis on any problems they are experiencing.

WHEN I get the chance, I like to browse round aquarium shops as unobtrusively as possible and I dislike it when I am badgered by some over-enthusiastic assistant trying to persuade me to buy fish before I have made up my mind. I dare say that there are others like me who would spend more money if left alone than if pounced upon as a possible customer. I was very glad to find on a recent visit to the new Edgware Road, London, premises, opened by Lakeside Aquatic and Aviary Supplies, that first of all the staff were courteous and let me look around at my leisure and that the lay-out of the premises set a high standard which I think will be appreciated by those who visit the shop. A word with the proprietor, who has, more recently, opened a branch in Kensington, confirms that he is aware that good presentation is a fundamental of good salesmanship. I am sure that being able to buy just what I want, in clean surroundings, will make me want to go there again.

THE schedules for the National Exhibition were, I learned, going to be a little late from the printers so I tried to help would-be exhibitors by sending out a hurriedly drafted provisional schedule to all clubs. My endeavour to be helpful has earned me no thanks but, instead, a gentle rap over the knuckles by the F.B.A.S. I used the words "judged in the normal way under F.B.A.S. rules" whereas I meant to imply that the exhibits would be judged to F.B.A.S. standards, since the show is, as in previous years, controlled by comprehensive rules drawn up by the promoters. Sorry!

Circumstances have arisen whereby three of the advertised judges will not be able to fulfil the duties they were invited to undertake. In one case the judge preferred to take the furnished aquaria classes to the championship classes for Barbs but the aquaria section committee decided not to change the judges round. Messrs. W. G. Phillips and J. H. Gloyn have been invited to step into the breach.

National Exhibition of Cage Birds and Aquaria

Excellent Support Given by Aquarists and Birdkeepers

AQUARISTS and birdkeepers all over the country have supported the 1951 National Exhibition of Cage Birds and Aquaria very well indeed and thousands of exhibits will be on view on December 6, 7 and 8 in the National Hall, Olympia.

Fishkeepers visiting the show will be able to see not only the aquaria exhibits in the classes which form the WATER LIFE section but also the well-supported classes which make up the annual shows of the Goldfish Society of Great Britain and the Guppy Breeders' Society. They will also find much of interest to them in the remarkable display of over six thousand birds.

Specialist Clubs Co-operate

The idea that a specialist club should run its annual show in conjunction with the WATER LIFE event was first mooted by the Goldfish Society and soon after the promoters had agreed to the proposal they had a similar request from the Guppy Breeders' Society, which was accepted.

The Goldfish Society is staging adult classes, 1951 breeders' classes and 1950 breeders' classes together with one non-competitive class for self-coloured fishes. Their classification has been based on the society's four basic varieties (Singletails, Twintails, Globe-eyes and Brambleheads) and judging will be in accordance with the society's standards for these four forms. The society recognizes three scale groups—metallic, nacreous, and matt—and the competitors have had to indicate in which of these three groups their exhibits fall.

In the Guppy section, the G.B.S. have put on a very full classification with separate classes for the different recognised types, including the new Valtails and Scarftails, the standards for which are described in this issue. This, the first specialist society to be formed in the aquaria world, also has its own standards for all recognised forms of *Lebistes reticulatus* and, with their recently modified pointing system in operation, they will be able to show to the public winning fish which come very near to the ideals.

Furnished Aquaria Section

Turning to the WATER LIFE section, here, once again, a feature will be the classes for furnished aquaria. Four are being put on, two for clubs and two for individuals, for tropical and coldwater tanks respectively. The standard for this section has always been high and this time the competing clubs have an added incentive for WATER LIFE offers a trophy for the best interclub furnished tank. This year some clubs which, hitherto, have taken part in the competition have fallen out but in their place are others including provincial clubs from as far away as Winchester, Blackpool and Reading, whilst one new club which held its first meeting on the night before entries closed hurriedly made an entry the next day. Such commendable enthusiasm deserves a reward.

In the breeders' classes, there are some good entries both for the Goldfish classes and in those provided for tropical species. All the fish in this section are being shown in teams of six, in itself an exacting condition, and the fish must have been bred during 1951. The judges will be provided with the dates the fish were born before

judging takes place and the age of the fish will be taken into consideration.

An entirely new venture this year was to cater for Championship classes and here we shall see fish entered by individual exhibitors backed up by club nominations. Although the conditions governing these classes were sent to all clubs and, in addition, were explained in detail in the schedule, it soon became apparent that many exhibitors had misread the conditions and a large number of entries had to be rejected. Rather than disappoint too many clubs and exhibitors, the aquaria section committee agreed to a suggestion that rule 3 in the schedule should be modified to permit more than one entry per club in each class and all clubs were notified. This decision was made rather late and, although there will be keen competition by exhibitors on behalf of a number of clubs, it is possible that the idea of Championship classes will not catch on until next year. Aquarists visiting the show will be able to see the specimens which the exhibitors consider worthy of championship status and we think that the judges will have a difficult job here to sort out the winners.

Good Display of Plants

Other classes scheduled are for plants, home-made apparatus and reptiles and amphibians. In the first mentioned, one of the two classes is very well supported, despite the fact that the show is held at a time of the year when it is difficult to enter plants in the best of condition.

The judges for the WATER LIFE section have been selected from those approved and in conjunction with the F.B.A.S. In the G.S.G.B. classes, panels of members will point the entries while the G.B.S. have appointed their own adjudicators. The WATER LIFE section will be judged according to F.B.A.S. standards and it will be interesting to compare the winners in the Goldfish classes with those which lead the G.S.G.B. classes, for, whilst virtually the same varieties of *Carassius auratus*, the exhibitors will have selected specimens which come nearest, in their opinion, to the standard obtaining in the class entered. This exhibition may be the means of showing up the good and bad points of both the F.B.A.S. and G.S.G.B. systems for it is the first time that the two sets of standards have been in operation at one event.

Exhibitors are reminded that entries in Classes 304-320 can be staged on WEDNESDAY, 5th December, between 2 p.m. and 9 p.m. and up to 9 a.m. on THURSDAY, 6th December. Entries in Classes 300-303 must be completed, ready for judging, by 9 a.m. on Thursday, 6th December. The tanks in these four classes can be set up at any time between 6 p.m. and 9 p.m. on TUESDAY, 4th December and the fish can be added between 2 p.m. and 9 p.m. on WEDNESDAY, 5th December. G.S.G.B. and G.B.S. members should stage their entries on the Wednesday evening.

The Show is open to the public 2.30 to 9 p.m. on December 6th, 10 a.m. to 9 p.m. on December 7th and 10 a.m. to 8 p.m. on December 8th. Admission 2s. Children under 14, half price. Season tickets are available at 5s.

Improved Standard at Suffolk Aquarists' Exhibition

PRESIDENT of the Suffolk A. & P.A., Mr. F. W. Brinkley, reports that at the ninth annual show of the society there was "distinct progress made in the set-up and the quality of the exhibits was very much improved." There were twenty classes, the majority well supported with the trophy winners as follows:—Lord Belstead Challenge Cup (most interesting exhibit), Mr. C. W. Porter; Lord Woodbridge Challenge Cup (best coldwater fish, excluding Goldfish), Mr. F. W. Brinkley; Mrs. Singleton Challenge Trophy (best Goldfish), C. J. Ricketts; Mrs. Singleton Challenge Tankard (best Shubunkins bred by member since last show), Mr. F. W. Hanson; Clavering Funon Challenge Cup (best Anabantid or Cichlid), Mr. F. W. Brinkley; Clarke Challenge Cup (best tropical breeders' exhibit), Mr. C. W. Porter; Parkington Challenge Cup (best reptile or amphibian), Mr. S. Ratcliffe; Clarke Challenge Cup (best furnished aquarium), Mr. A. Mather; Shute Challenge Cup (best juvenile furnished aquarium), Mr. R. Lord.

The four-day show was opened by Alderman F. H. Warner, J.P., and trophies were presented by the Mayor of Ipswich, Alderman A. J. Colthorpe, J.P., on the last day. The venue was the Art Gallery, High Street, Ipswich, and Capt. L. C. Betts and Mrs. W. M. Meadows were the judges. This year the society received no grant from the local Education Committee and bore the entire cost of the venture itself, there once again being no charge for admission or catalogue.

PRIZEWINNERS

LIVEBEARERS (17): 1, R. Phillips (Albino Swords); 2, G. W. Jackson (Scarftail Gunpers); 3, R. Phillips (Tuxedo Platies); 4, R. Phillips, vhc. Mrs. Barwell, **EGLAYING TOOTH CARPS** (2): 1, Mrs. Barwell (*Epilplatys thaperi*); **CATFISH & LOACH** (2): 1, G. W. Jackson

(Kuhli Loach); **BARBS** (12): 1, E. R. Jennings (Tiger); 2, E. R. Jennings (Cherry); 3, G. W. Cox (Rosa); 4, F. W. Brinkley; **DANIOS AND RASBORAS ETC.** (9): 1, Mrs. Barwell (Pearl Danio); 2, R. Phillips (Citrus Danio); 3, G. W. Cox (Giant Danio); 4, F. W. Brinkley; **CHARACINS** (11): 1, C. W. Porter (*H. serpaia*); 2, Mrs. Barwell (*Nannostomus anomolus*); 3, A. Mather (*Bristella ruddii*); 4, G. W. Jackson; **ANABANTIDS** (10): 1, A. Mather (Pearl Gourami); 2, C. W. Porter (Dwarf Gourami); 3, W. G. Hugges (Blue Gourami); 4, R. Phillips; **CICHLIDS** (8): 1, F. W. Brinkley (Brazilian Cichlid); 2, F. W. Brinkley (*Cichlasoma festuivum*); 3, C. Sansom (Guernsey); 4, C. Sansom; **TROP. BREEDERS** (20): 1, C. W. Porter (Glowlight); 2, C. W. Porter (Nannostomus anomolus); 3, J. P. Call (Firemouth); 4, C. W. Porter (Tiger Barb); vhc. C. W. Porter; bc. J. P. Call; **RR11 COARSE FISH** (5): 1, F. W. Brinkley (Perch); 2, W. G. Gammage (Common Rudd); 3, F. W. Brinkley (Common Hell); **A.O.S. COLDW. FISH** (9): 1, 2 & 3, F. W. Brinkley (Sunfish, Rudd and Weatherfish); **FANCY GOLDI & CARP** (14): 1, A. Mather (Shubunkin); 2, F. W. Brinkley (Shubunkin); 3, Miss K. Taylor (Shubunkin); 4, Miss K. Taylor (Hi-gon); vhc. J. P. Call; **COMMON GOLDF.** (8): 1, C. J. Ricketts; 2, F. W. Brinkley; 3, W. G. Gammage; **BREEDER'S SHUBUNKINS** 1, A. Hutson; 2, & 3, F. W. Brinkley; **MARINE** (12): Dickerson; **REPTILES & AMPHIBIA** (14): 1, S. Ratcliffe (Lord Derby Lizard); 2, M. Ratnes (Common Frog); 3, H. W. Beaumont (Green Tortoise); 4, M. J. Brooks (European Terrapin); vhc. S. Ratcliffe; **AQUATIC PLANTS** 1, H. R. Frost (Water Soldier); 2, M. Ratnes (Hornwort); 3, G. W. Jackson (Cymbid); 4, G. W. Jackson (Myriophyllum); **SENIOR TROP. FURN. AQUARIA** 1, C. W. Porter; 2, J. P. Call; 3, A. Mather; **SENIOR COLDW. FURN. AQUARIA** 1, A. Mather; 2, H. R. Frost; 3, Miss K. Taylor; **JUNIOR FURN. AQUARIA** 1, R. Lord (coldwater); 2, R. Corbould (coldwater); 3, C. Jay (tropical);

Dewsbury Wins Club Class at Huddersfield Show

AS part of the town's Festival celebrations Huddersfield A.S. staged their annual show this autumn. It was opened by the Mayor of Huddersfield. There were 10 tropical aquarium on view, six classes of individual fish and some non-competitive cold water exhibits. An extremely attractive water garden was constructed and there was a naturalist's stand.

In the inter-club furnished aquaria class, which was restricted to societies in the vicinity of Huddersfield, Dewsbury A.S. took the first prize. Trophies and prizes will be presented at the Huddersfield society's annual dinner on December 5.

Halifax A.S. Annual Show

THE fifth annual show and festival year celebration staged by the Halifax A.S. was opened by the Mayor (Ald. A. Pickles, O.B.E., J.P.) and Mayoress on Sept. 27. The event was of three days' duration.

An average daily attendance of 1,150 people made the exhibition a financial success. Fourteen classes were staged and among these, for the first time in the Halifax shows, was one for tropical breeders' exhibits, each entry consisting of six fishes. Show secretary was Mr. G. Lewis and the judges were Messrs. Chapman, Cooke and Aldred.

PRIZEWINNERS

FURN. AQUARIA (TROPICAL): 1, J. A. L. Rashley; 2, H. W. Pollard; 1, D. Collingwood; **FURN. AQUARIA (TROP. NOVICE)**: 1, H. Spencer; 2, J. A. Holkway; 3, G. Hadfield; **FURN. AQUARIA (COLDW.)**: 1, J. A. Holkway; 2, J. A. L. Rashley; 3, J. Stott; **A. N. GUPPY**: 1, E. Priestley; 2, A. Stottard; 1, N. Fletcher; **A.O.S. LIVEBEARER**: 1, J. Ryan; 2, G. Wood; 3, A. Ellis; **SIAMEN FIGHTERS**: 1, T. T. Hadfield; 2, E. Priestley; 3, H. Spencer; **A.O.S. LABYRINTH**: 1, J. Lawson; 2, J. Greenwood; 3, B. Greenwood; **A.S. EGG-LAYER**: 1, J. A. L. Rashley; 2, H.

Greenwood; 3, J. Ryan; **A.V. GOLDFISH**: 1, 2 & 3, H. W. Pollard; **A.S. COLDW. (EXCEPT GOLDF.)**: 1 & 3, H. W. Pollard; 2, H. Matfield; **A.S. TROP. (NOVICE)**: 1 & 3, J. Womersley; 2, S. W. Lord; **A.V. COLDWATER (NOVICE)**: 1 & 3, H. Matfield; 2, S. W. Lord; **BREEDERS' (TROPICAL)**: 1, H. W. Pollard (*Nannostomus anomolus*); 2, D. Collingwood (Red Swords); 3, J. A. L. Rashley (Wagtail Platies).

Blackburn's 2000 Attendance

WITH the generous support of the Blackpool, W. Preston, Accrington and Bolton societies the Blackburn A.S. staged their very successful second annual show on October 15-17. Some 2,000 people attended. Prize for the best furnished aquarium went to Mr. Bailey of Accrington.

S.E. London and N. Kent Aquarists' Group

THIS area organisation came into being at the beginning of the year with the committee consisting of Mr. Butler (Welling), chairman; and two representatives from each of the five participating clubs, Welling, Shooters Hill, Erith, Amersham Grove (New Cross) and Greenwich. The meetings are held quarterly. Achievements so far recorded are—the setting up of a judges' and speakers' panel; the opening of club meetings, outings, etc. to members of other societies and the setting up of a knockout competition consisting of seven fish classes. In connection with the latter contest Mr. Butler has presented a trophy. This year's results are—1, N. W. Lord; Greenwich beat Erith; next round—Greenwich beat Shooters Hill and Amersham Grove beat Welling; final round, Greenwich beat Amersham Grove. Two other competitions were staged at Erith on August 6 (won by Greenwich) and at Greenwich (breeders' show) on Nov. 17.

Mr. G. Dawkins, secretary, writes, "the greatest achievement must, however, be the fact that aquarists spread over a wide area of S.E. London and N. Kent are meeting one another and are gaining more experience and friends."

Fine Public Response to Lambeth A.S. Effort

LAMBETH A.S. staged seventeen classes in their one-day show on October 13. There was a very representative entry and trophy winners were Messrs G. Riley, M. Mayer, R. Mullet, M. Kelsey and Mrs. Hinton. No admission fee was charged and 2,200 people attended, including representatives from 24 societies. Councillor J. W. Darley, President of the society, presented the awards.

PRIZEWINNERS

AWARDS: 1, Kelsey (Red); 2, Pottle (Albino); 3, Pottle (Green); 4, J. Smith (Red); **MOLLUSCS**: 1, Mullet (Pezoma); 2, Godfrey (Permay); 3, Parmenter (Scherzer); **PLATIES**: 1, Parmenter (Red); 2, Parmenter (Sprangled); 3, Mullet (Red Wagtail); **GUPPIES**: 1, Wakefield (male Golden); 2, Wakefield (male Chertail); 3, Parmenter (male Robson); **CHARACINS**: 1, Rayner (Kite Tetra); 2, Mitchell (Black-line Tetra); 3, Misseton (*Pristella*); 4, Hutton (Beacon); **A.O.S. EGG-LAYER**: 1, Riley (Tiger Barb); 2, Parmenter (Nigger Barb); 3, Parmenter (Rosa Barb); 4, Mitchell (Catfish); **LABYRINTHS**: 1, Kelsey (Three-spot Gourami); 2, Hutton (Dwarf); 3, Rayner (Dwarf); **FIGHTERS**: 1, Wakefield (male Blue); **A.O.S. COLDW. FISH**: 1, Allen (Shubunkin); 2, Billings, Inc. (Silver Bream); 3, Parsons (Catfish); **BREEDERS' EXHIBIT**: 1, Pottle (Albino Swords); 2, Godfrey (Black Mollus); 3, Parmenter (Sphaerops); **PLANTS**: 1, Parmenter (*C. cordata*); 2, Mullet (*V. spaldina*); **FURN. AQUARIA**: 1, Hutton; 2, Mrs. Billings, Special Club Award for best individual effort, D. Marston.

Four Welsh Societies in Furnished Aquaria Contest

THE second annual show of Welsh National A.S. was held on Sept. 19-20 at the Cathay Restaurant. There were 13 classes and 98 entries—a good effort for a show which was not open. A challenge cup was competed for in a furnished aquaria contest between the four Welsh societies, Newport, Pontypool, Swansea and the Welsh National A.S. The Cup was won by the last mentioned society.

Mr. K. Jones, won the cups for best fish in show, best coldwater entry and juvenile exhibit. Mr. A. Batten was awarded the trophies for the best tropical entry and best furnished aquarium.

Walthamstow's 250 Entries

A HIGHLY instructional and successful show was staged recently by the Walthamstow A.S. at Cunway Hall, High Street, Walthamstow. There was a large attendance and Leon Intero was shown in the 250 exhibits of tropical and coldwater fish.

The society's members competed for plaques and cups in the competitive classes. The prizes were presented, on behalf of the society, by Mr. Whyles, proprietor of the Walthamstow-Guardian, assisted by his daughter. The following members of the society were plaque winners—Messrs. Rogers, Johnson, Whithead, Davies, Leek, Brooks, Payne, Goldsmith, Dalton, Thompson, Wigram, Crow, Inbury. Two cups were presented for the finest fish in the show. These were won by Messrs. Brooks (tropical) and Crow (coldwater).

More Diploma Winners

RECENT winners of WATER LIFE Diplomas are—Accrington A.S. Show (Sept. 6-8); Mrs. V. Stephenson (ornamental aquarium); Burton A.S. Show (Sept. 20); Mr. E. Cotton (best coldwater fish); Southampton A.S. Show (Sept. 6-8); Mr. M. E. Hands (best exhibit in show); Wiltenden A.C. Show (Sept. 15-16); Mr. R. Dash (best furnished aquarium) and Mr. R. A. Cooper (best fish in show).

Heavy pressure on space has resulted in omission of Bradford, Bristol, Scottish A.S. and Tottenham show reports. These will appear in the next issue.

Young Banbury Society Stages Festival Aquaria Show Nearly One Hundred Entries at Second Exhibition

EVER tried being a successful keeper and breeder of tropical fish without electricity but with the assistance of paraffin lamps, hot water bottles or straightforward introduction of warm water petichanism? If you have you will be aware that petichanism is the impediment that keeps everything running according to plan so it was not surprising to find that there was plenty of assistance in the Banbury A.S., where some of the members have to improvise with heating appliances. In fact, the members of the society are 100 per cent. keen and anxious eager to publicise the hobby. Count among them Mr. Sawyer (the secretary and paraffin lamp user) and his kind *Thayeria albanis* and *Burbus ichaberti*. Mr. Stacewood (chairman) and a number of others whom we met when visiting the society's three-day Festival Show (Sept. 6-8) on Sept. 7.

Banbury is a country town with around 18,000 inhabitants but the society is making rapid progress with forty paid-up members and nearly 100 entries in this, their second show. Members have not visited any other exhibitions so they had no standard against which to assess the merits of their fish. It is, therefore, not surprising that some entries were mediocre but others would have been a credit at any exhibition. One really healthy sign was 16 entries in the breeders' class which certainly indicates that Banbury is developing along the right lines and that the members are advancing well beyond the stage when one tank and some pleasing fish are all that they care in their haphazard activities.

The staging was adequate (in fact, bird show staging was used for the tropical exhibit) and special mention should be made of Mr. Hazlewood's attractive *Trichoptera* display. The show was held in the hall of the Town Hall and was well attended by Mr. W. L. Mandeville. If we might permit a suggestion for a useful refinement at future events it would be that the tanks be labelled to indicate the fish they contain.

PRIZEWINNERS

FANTAILS AND MOODS (7): 1, A Fox Cup (one colour water exhibit), G. Scott; 2, Major of good size and colour, G. Scott; 3, *Trichoptera* (one small behind eye), G. Scott; 4, *Trichoptera* (one small behind eye), G. Scott; 5, *Trichoptera* (one small behind eye), G. Scott; 6, *Trichoptera* (one small behind eye), G. Scott; 7, *Trichoptera* (one small behind eye), G. Scott.

MALE FIGHTERS (5): 1, Mrs. M. E. Taylor, *Wagtails* (one good female but male very poor, both showed tail dorsally); 2, Mrs. M. E. Taylor, *Wagtails* (one good female but male very poor, both showed tail dorsally); 3, Mrs. M. E. Taylor, *Wagtails* (one good female but male very poor, both showed tail dorsally); 4, Mrs. M. E. Taylor, *Wagtails* (one good female but male very poor, both showed tail dorsally); 5, Mrs. M. E. Taylor, *Wagtails* (one good female but male very poor, both showed tail dorsally).

WAGTAILS (2): 1, Miss J. Emmott, Very good black colouring but small size; 2, Mrs. M. E. Taylor, not quite colour summary and male poor body.

GAFFLES (6): 1, Williams, Lyretail, good colour; 2, A. J. Prior, Good American-type and reasonable size; 3, Prior, with uneven caudal extremities; 4, Prior, *Wagtails* (5); 1, O. W. Fox, Blue-Red, best *Wagtails* but heavy body; 2, E. A. Pritchard, Maudy Blue, poor *Wagtails* development; 3, Miss J. Emmott, Cambridgeshire, reasonable *Wagtails* body and colour; 4, Mrs. M. E. Taylor, A.O.S.; 5, LARRYNTH (2); 1, A. A. Watson, Partridge, dull colour, good fins; 2, D. Thomas, Gouramine, badly matched.

DANICUS & RASBORAS (6): 1, Mrs. M. F. Taylor, Zebra, female good but male had imperfect lines; 2, E. A. Pritchard, Zebra pair, both fish had imperfect lines; 3, E. Wood, Glarens, very good colour and nice condition; 4, BARKS (6); 1, Mrs. M. F. Taylor, Cherries, very fine fish, superb colour; 2, Mrs. R. Damberton, Rotty, both good condition, reasonable colour; 3, Mrs. Harris, Rotty, both, not well matched, better pair; 4, A. Sawyer, *HYPHESOBRYCON*

(6): 1, O. W. Fox, Neons, good colour, poor department; 2, R. Wood, Black-line Tetra, pale colour; 3, Mrs. M. E. Taylor, vhc, A. E. Harris, Pater, smaller Neons, candidate of one ragged; A.O.S. **CHARACTS** (6): 1, J. R. Baeban Hunt Cup, best pair; 2, A. Sawyer, Very fine *Thayeria* 3 & 4 vhc; 3, E. Williams, Good pair of *Thayeria* 3 & 4 vhc; 4, Sawyer, 3rd A.O.S. **TROPICAL** (7): 1 & 3, Sh. Tetra, 1st A.O.S. **TROPICAL** (7): 1 & 3, O. W. Fox, 1st A.O.S. White Clouds, good fish but made them-selves and pale colour; 2, 3rd, good large pair of Angels, not quite finish; 4, MUM, BEES' BREEDERS (16): 1 & Peake Trophy, best breeders' exhibit; A. Sawyer, Fine, well-matched team of *Thayeria*; 2, A. Sawyer, Well-

grown and well matched *Burbus ichaberti*; 3, O. W. Fox, White Clouds, majority good fish but not even development; vhc, R. Wood; **COLDW FURN AQUARIA** (4): 1 & Marbles Cup, best members' dressed tank; D. Graham, Natural set-up but heavy use of rock and plants; 2, G. Scott, Good plants but little evidence of design; **TROP. FURN AQUARIA** (7): 1, O. W. Fox, Attractive but unoriginal set-up; 2, R. Sawyer, Poor design and straggly plants; 3, A. Sawyer, Contented stability; 4, A. Sawyer, Plants nice, well-kept; 5, M. E. Taylor, **JUNIOR FURN AQUARIA** 1 & B.M. Fox, Best junior members' dressed tank; F. Scott, Child's tank embodying natural set-up; Good plants but not well positioned; 2, J. Burns, Tropical tank with few plants. This is the lad who introduces warm water to his tank periodically to keep up the temperature, yet the fish were in good condition.

Nottingham's Fifth Annual Show a Success



Fish, Reptiles, Amphibians and allied hobbies were represented in more than twenty displays. A big number of unusual exhibits attracted much attention from the large crowds of children and adults who went to the exhibition.

Show secretary W. C. Webber inspecting one of his own exhibits at the Nottingham Show.

THE Festival Year Aquarium Exhibition organised by the Nottingham A.S. was held at the Regent Hall, Nottingham during September. It was the fifth annual show to be organised by the society and proved the most ambitious to date. There were 160 tanks on display, the smallest of which was 12 in. in length and the largest, 3 ft.

As in previous years the exhibition was not confined solely to fish and this year there was a large section for reptiles and other animals. The show secretary, Mr. W. C. Webber, explained that these sections were principally introduced to serve as "bait" to the public.

"We often find people," commented Mr. Webber, "who would not come to the show solely to see fish. So we include reptile and animal exhibits in order to attract a wider body of visitors, and we find that once they are here they become very interested and absorbed by the fish themselves". This approach has certainly brought results and after the opening of the show by the Lord Mayor of Nottingham, a total of over 10,000 visitors attended. Organised parties of schoolchildren, numbering 3,000, were con-

cluded of particular interest included a fruit-eating fish, a rare Parrot fish, Skink and a large Box Cornerfish.

PRIZEWINNERS

MALE FIGHTERS: 1, E. Crowther, 2, W. Buddin; 3, A. Stone, A. V. CITY; 1 & 2, C. C. Webber; 2, W. Sawyer; 3, I. Allan, A.S. **CATFISH**: 1, I. Sandle; 2, E. C. Preedy; 3, C.

REPTILES ON SHOW

A Blue-tongued Skink and a Spotted-tailed Skink on display at Nottingham A.S. Show. They represent former part of the Reptile and Amphibia Section.

Photography: [A. Crisford]



Lily; **NEON TETRAS**: 1, E. C. Preedy; 2, M. Welch; 3, W. Sawyer; A. V. MALL; **GUPPY**: 1, W. Tomp; 2, G. M. Chaffin; 3, D. Pullin; A.S. DANIO; 1, A. Stone; 2, A. J. Prior; 3, E. C. Preedy; **COMMON GONDON**: 1, A. J. C. Lilley; 2, W. Buddin; **LONDON SHUS**: 1, E. Ballard; 2, W. Buddin; 3, A. E. Adcock; **BRISTOL SHUS**: 1, E. Ballard; 2, G. A. Adams; 3, A. E. Adcock; A.O.S. **COLDW. FISH**: 1 & 3, H. E. Ede (Ventrals); 2, W. C. Webber (Scalped Fantails); **MANS M. COLDW. FURN AQUARIA**: 1, Miss M. Chaffin; 2, Miss T. Martin; 3, Miss H. Stophenson; **JUNIOR TROP. FURN AQUARIA**: 1, Miss M. Chaffin; 2, J. Pell; 3, J. Robey; 4, Miss T. Martin; **SENIOR COLDW. FURN AQUARIA**: 1, M. Welch; 2, G. M. Chaffin; **TROP. FURN AQUARIA**: 1, D. Pullin; 2, A. Stone; 3, Mrs. J. Pullin; 4, W. A. Smith; **BREEDERS' COLDW.**: 1 & P. Plaque; W. C. Webber; 2 & 3, H. P. Lynn; 4, W. C. Webber; **BREEDERS' TROP.**: 1, Plaque and 2, D. Pullin; 3, E. C. Preedy; 4, G. M. Chaffin; **FURN VIVARIA**: 1, 2, & 3, G. Rose; 4, H. Walker.

TROPHIES

Brentnall Cup (Best Fish in Show), E. Ballard (Best Fish in Show), E. Ballard (Best Striped Skink), W. Almscup Cup (Best Trop. Fish in Show), W. Tomp (Double award), Brown & Taylor Cup (Best Coldw. Furn. Aquarium), M. Welch (Postery Supplies Cup (Best Trop. Furn. Aquaria), D. Pullin, Mackenzie & Lynn Reptile Cup, G. Rose, Junior Trophy (Best Furn. Aquaria), Miss M. Chaffin, Smith Appreciation Cup, Mr. & Mrs. Pullin (Jointly).

Young Banbury Society Stages Festival Aquaria Show Nearly One Hundred Entries at Second Exhibition

After tried being a successful keeper and a possessor of tropical fish without electricity but with the assistance of paraffin lamps, but water heater or straightforward introduction of water from periodically. If you have you will be aware that enthusiasm in the ingredients that keeps something running according to plan so it was not surprising to find that there was plenty of enthusiasm in the Banbury A.S. where some of the members have to improve with heating arrangements. In the society there is a nucleus of 100 per cent keen aquarists eager to publish the hobby. Count among them Mr. Sawyer (the secretary and paraffin lamp user and has bred *Therapsid* *chilodactylus* and *Burhan* *is* *haberyi*), Mr. Mrs. W. E. Taylor (show secretary), Mr. Macdonald (chairman) and a number of others whom we met when visiting the society's three-day Festival Show (Sept. 6-8) on Sept. 7.

Banbury is a country town with around 18,000 inhabitants but the society is making rapid progress with forty paid-up members and nearly 100 entries in this, their second show. Members have not visited any other exhibitions so they had no standard against which to assess the merits of their fish. It is, therefore, not surprising that some entries were mediocre but others would have been a credit at any exhibition. One really healthy sign was 10 entries in the breeders' class which certainly indicates that Banbury is developing along the right lines and that the members are advancing well beyond the stage when one starts and some pleasing fish are all that they desire in their fishkeeping activities.

The staging was adequate (in fact, bird show staging was used for the tropical exhibits) and special mention should be made of Mr. Hazlewood's attractive trade displays. The show was held in two rooms of the Town Hall and it was judged by Mr. W. L. Mandeville. If we might make a suggestion for a useful refinement at future events it would be that the tanks be labelled to indicate the fish they contain.

(6): 1. G. W. Fox, Neons, good colour, poor department. 2. R. Wood, Black-line Tetra, pale colour. 3. Mrs. M. E. Taylor, vhc. A. E. Harris, Pales, smaller Neons, caudal of one ragged. A.O.S. CHARACIN (6): 1. A. Rumbin Hunt Cup, best pair, A. Sawyer, Very fine *Therapsid* *chilodactylus*. 2. F. Williams, Good pair of *Burhan* *is* *haberyi*. 3. A. Sawyer, Ted were small but well-conditioned Silver Tetras. A.O.S. TROPICAL (3): 1. A. J. G. W. Fox, Leaders White Clouds, good female but male thin-bodied and pale colour. 3rd, good large pair of Angels, not quite finish. MEMBERS BREEDERS (16): 1. A. Peake Trophy, best breeders' exhibit, A. Sawyer, Fine, well-matched team of *Therapsid*. 2. A. Sawyer, Well-

grown and well matched *Burhan*. 3. O. W. Fox, White Clouds, majority good fish but not even development. vhc. R. Wood. COLDWATER FURN AQUARIA (4): 1. A. Mathers Cup, best members' dressed tank, D. Graham, Natural set-up but heavy use of rock and plants. 2. G. Scott, Good plants but little evidence of design. TROP. FURN AQUARIA (7): 1. O. W. Fox, Attractive but unoriginal set-up. 2. R. Wood, Poor design and straggly plants. 3. A. Sawyer, Contained mainly brown-head fish. Plants not well-positioned and blue-green algae present. vhc. Mrs. M. E. Taylor. JUNIOR FURN AQUARIA: 1. A. Bolton Cup, best junior members' dressed tank, F. Scott. Coldwater tank embodying natural set-up. Good plants but not well positioned. 2. J. Burns, Tropical tank with few plants. This is the first who introduces warm water to his tank periodically to keep up the temperature, yet the fish were in good condition.

Nottingham's Fifth Annual Show a Success



Show secretary W. C. Webber inspecting one of his own exhibits at the Nottingham Show.

Fish, Reptiles, Amphibians and allied hobbies were represented in more than twenty displays. A big number of unusual exhibits attracted much attention from the large crowds of children and adults who went to the exhibition.

PRIZEWINNERS

FANTAILS AND MOONS (7): 1. A Fox Cup (best coldwater exhibit), G. Scott, Moor of good size and condition. Slightly scaly, colour, reasonable eye. 2. J. & G. Scott, Two Moons (well behind 1st body) and a Fantail. SEIHS (5): 1. J. & G. Scott, Leader had long body, good condition and reasonable finnage; second, pale colour and narrow caudal; third, better shape and development but imperfect dorsal and pointed head. A.O.V. GOLDF (6): 1. A. J. G. W. Fox, London-type *Shubunkin*, Leader of good colour, slightly narrow caudal. Second, but body of strange shape. 3. Wynodil, large common, good shape, failed caudal, fair colour.

TROPICAL CLASSES

A. V. SWORD (7): 1. Mrs. M. E. Taylor, Red pair, good except colour. 2. Miss J. Bennett, Small red-eyed Reds. 1. D. Thomas, Good Grathis except small male. vhc. A. Sawyer. A.V. PLATY (3): 1. Mrs. Harp, Variatus, quite good colour. 3. Mrs. M. E. Taylor, Wagtails, good female but male very poor. Both showed and dressed. A. V. MOLLIE (2): 1. Miss J. Bennett, Very good black colouring but small size. 2. Mrs. M. E. Taylor, not quite colouring anyway and male poor body. GUPPIES (6): 1. Williams, Lyretail, good colour. 2. A. J. G. W. Fox, Good American type and reasonable care with upturn caudal extension. vhc. S. Price. FIGHTERS (5): 1. O. W. Fox, Blue-Red, best finnage but heavy body. 2. E. A. Prattman, Mandy Blue, poor finnage development. 3. Miss J. Bennett, Cambusia, reasonable finnage, body and colour. vhc. Mrs. M. E. Taylor. A.O.S. LABYRINTH (2): 1. A. Watson, Paradise, dull colour, good fins. 2. D. Thomas, *Paradise*, badly matched. DANIOS & RASHORAS (6): 1. Mrs. M. E. Taylor, Zebra, female good but male had imperfect fins. 2. E. A. Prattman, Zebra pair, both fish had imperfect fins. 3. R. Wood, Gharas, very good colour and near condition. BARRS (6): 1. Mrs. M. Fencon, Cherries, very fine fish, superb colour. 2. Mrs. R. Dumbleton, Rosy Barbs, good condition, reasonable colour. 3. Mrs. Harris, Rosy Barbs, not well matched, better male. vhc. A. Sawyer. HYPHESORRYCON

THE Festival Year Aquarium Exhibition organized by the Nottingham A.S. was held at the Regent Hall, Nottingham during September. It was the fifth annual show to be organized by the society and proved the most ambitious so far. There were 100 tanks on display, the smallest of which was 12 in. in length and the largest, 3 ft.

As in previous years the exhibition was not confined solely to fish and this year there was a large section for reptiles and other animals. The show secretary, Mr. W. C. Webber, explained that these sections were principally intended to serve as "bait" to the public.

"We often find people," commented Mr. Webber, "who would not come to the show solely to see fish. So we include reptile and animal exhibits in order to attract a wider body of visitors, and we find that soon they are how they become very interested and absorbed by the fish themselves." This approach has certainly brought results and after the opening of the show by the Lord Mayor of Nottingham, a total of over 10,000 visitors attended. Organized parties of schoolchildren, numbering 3,000, were conducted round.

Exhibits of particular interest included a fruit-eating but, two rare Piranha fish (*Piranha*), *Sarbanus*, Blind Cave Fish, two *Skinks* and a large *Roa Constrictor*.

PRIZEWINNERS

MALE FIGHTERS: 1. E. Crowther, 2. W. Buddin, 1. A. Stone, A.V. PLATY: 1. A. J. C. Lilley, 3. I. Saville, A.V. SWORDTAIL: 1. W. C. Webber, 2. W. Saywell, 3. T. Allan, A.S. CATFISH: 1. I. Saville, 2. E. C. Preedy, 3. C.

Lilley, NEON TETRAS: 1. E. C. Preedy, 2. M. Welch, 3. W. Saywell, A.V. MALLI GUPPY: 1. W. Town, 2. G. M. Challans, 3. D. Pullon, A.S. DANIO: 1. A. Stone, 2. A. J. M. Welch, A FIFTY-FIVE & OLIOLEPIS: 1. A. J. D. Pullon, 3. E. C. Preedy, COMMON GOLDF: 1. A. J. C. Lilley, 2. W. Buddin, LONDON SHUS: 1. E. Ballard, 2. W. Buddin, 3. A. E. Adcock, BRISTOL SHUS: 1. E. Ballard, 2. G. A. Atkins, 3. A. E. Adcock, A.O.S. COLDW. FISH: 1. A. J. Ede (Vallarta), 2. W. C. Webber (Scaled Fantail), JUNIOR COLDW. FURN AQUARIA: 1. Miss M. Challans, 2. Mrs. T. Martin, 3. Mrs. H. Stephenson, JUNIOR TROP. FURN AQUARIA: 1. Miss M. Challans, 2. J. Pell, 3. J. Roby, 4. Mrs. T. Martin, SENIOR COLDW. FURN AQUARIA: 1. M. Welch, 2. G. M. Challans, 3. A. E. Adcock, 4. Mrs. I. A. Lynn, SENIOR TROP. FURN AQUARIA: 1. D. Pullon, 2. A. Stone, 3. Mrs. J. Pullon, 4. W. A. Smith, BREEDERS' COLDW.: 1. A. Platon, W. C. Webber, 2. A. H. P. Lynn, 4. W. C. Webber, BREEDERS' TROP.: 1. Plaque, and 2. D. Pullon, 3. E. C. Preedy, 4. G. M. Challans, FURN VIVARIA: 1. 2. A. J. G. W. Fox, 4. H. Walker.

TROPHIES

Best of all Cup (Best Fish in Show), E. Ballard (Bristol *Shubunkin*), Aquarium Cup (Best Coldwater Fish in Show), E. Ballard (Bristol *Shubunkin*), Amoson Cup (Best Trop. Fish in Show), W. Town (Doubledown), Brown & Taylor Cup (Best Coldwater Aquarist), M. Welch (Poultry Supplies Cup (Best Trop. Furn. Aquaria), D. Pullon, Mackerenzie & Lynn (Reptile Cup), G. Ross, Junior Trophy (Best Furn. Aquaria), Mrs. M. Challans, South Appreciation Cup, Mr. & Mrs. Pullon (jointly).

REPTILES ON SHOW

A Blue-crowned Skink and Spine-tailed Skink on display at Nottingham A.S. Show. These creatures formed part of the Reptile and Amphibian Section.

Photograph: A. Crossland



First-ever Public All-Breeders Show

E. London Society Sets Standard at Successful Members' Event

THE idea of running an independent breeders' show had been considered by F. London & A.P.A. for some time and it was finally planned and staged on October 6. The need was evidenced by the result. Over 80 teams of members' fish were staged in what, it is believed, was the first comprehensive all-breeders' show open to the public. It was a fine reflection of the society's achievements and the very best indication that members are conducting their fish-keeping along the right lines. This was not a meet where the comparative quality of the exhibits was of prime importance, what was desired was an indication of whether the breeding had been along the right lines. Consequently, in a number of classes, awards were duplicated if the fish—and the breeding of them—deserved recognition. Messrs. Moore, Creed, Looker and Bradley adjudicated in the seventeen classes, all of which were well supported. Some extremely attractive prize cards were prepared by Mr. Blackett for the event.

First prizewinner in the Guppy class was Mr. E. A. Davey with a very fine team of Doublebows. One second prizewinner was Mr. Davey and the other, Miss P. Newman. The Platies were headed by a well-shaped team of *P. variatus* showing good golden colour, owned by Mr. A. Lanceman. Teams from Mrs. L. C. Holloway and Messrs. A. Gibbons and A. Lanceman took second positions here. Just as the other livebearer species seem to be gaining popularity so swordtails are definitely suffering an eclipse in the society although Mr. E. R. Knell did take a third award in the class for this species. There were two first prizewinners in the Mollie class, Messrs. A. E. Harding and A. H. Wilden. The former with a trio of six-month old Speckled Mollies of very good size and shape (the male had a rather high dorsal) and the latter with a team of *M. latipinna*, the male of which was a particularly fine fish. Second awards went to Messrs. J. E. Butt, P. S. Campkin and E. A.

Davey. Mr. A. J. Holloway took all the places in the A.O.S. Livebearers with a well matched team of *Girardinus metallicus* in the lead.

Among the egglayers Mr. A. H. Wilden won the premier position with some young Flame Fish and the second prize with *H. scyllifer*. Strongest class in this section was that for Barbs with no fewer than three first prizes given. These went to Mr. A. Lanceman (Rosy Barbs showing good colour and shape and condition), Mr. A. H. Wilden (Cherry Barbs, fine colour with particularly good colour definition) and Mr. A. J. Collyer (Tiger Barbs, first-class fish in excellent condition which should colour well as they develop). Messrs. E. R. Knell and Collyer took second prizes in this class. The Danio class also brought forth some fine exhibits with Mr. T. E. Butt taking two of the first prizes. One of these entries consisted of "Golden Danios"—a strain of Pearl Danio with a very obvious golden overlay and conspicuous red colouring in the caudal—very fine fish. The other entry was of Zebras, two of which had slight faults in their markings. The further first prizewinner was Mr. W. T. Hylton with some good Spotted Danios. Messrs.

T. E. Butt and Lanceman took second awards. All prizewinning fish were White Cloud Mountain Minnows in the A.O.S. Egglayer class, Mr. P. S. Campkin being awarded first prize with some full-grown specimens showing fine red colouring and excellent shape and condition. Mr. A. E. Collyer was second. Mrs. L. C. Holloway took first and second prizes in the Siamese Fighter class with teams of Blues. In the Dwarf Gourami class Mr. D. Chewright's fish won first and second prizes. The leaders were a well matched trio of good shape and with their colour showing up well. Two failed slightly on definition. Mr. R. L. Rayner, junior member, had on show some exceptional Three-spot Gouramies, which excelled in colour and took first prize in the A.O.S. Labyrinth class.

Entries were not too numerous in the coldwater section with Miss C. Bonsor taking the awards in the Common Goldfish class, Mr. F. A. Petto and Miss P. Newman in the Shubunkin class and Mr. F. A. Petto in the A.V. Fancy Goldfish. Miss C. Bonsor's leading team of Commons were good fish, with one failing on size, whilst Mr. Petto's first-prizewinning Shubunkins were well grown and matched but showed only reasonable colouring. The same exhibitor's leading team of Calico Fantais were of variable quality.

There were some good entries in the two plant classes, Mr. A. Lanceman winning a first in the Large Plant class with well grown *Cryptocoryne trimitti* and a second with Indian Fern. Mr. P. S. Campkin also won a second prize here. Mr. Lanceman led the Small Plant class with fine specimens of Twisted *Vallisneria*. Mrs. Lanceman was second with reasonable *Mistophyllum* sprigs and Mr. E. R. Knell also had a second award with *Ludwigia*.

Special prizewinners whose fish well deserved the awards they gained were as follows:—Breeding Achievement Cup—Mr. A. E. Collyer (Tiger Barbs); Plaques for best livebearers, egglayers, labyrinths and coldwater fish went to Mr. E. A. Davey (Doublebow Guppies), Mr. P. S. Campkin (White Clouds) and Mr. R. L. Rayner (Three-spot Gouramies) and Miss C. Bonsor (Common Goldfish), respectively.



Messrs. C. R. Looker and C. W. G. Creed, two of the judges at the E. London A. & P. A. breeders' show.

Birmingham Show (continued.)

guppies, 4, K. Beard, *H. serpis*, ZEBRAS (Two fish) (21): 1, Heath; 2, F. N. Baughan; 3, Mrs. J. Bowyer; 4, F. Jennings, Sr. All of good quality and not much to choose between them. Winners a very even couple, well marked. A.O.S. DANIO. (Two fish) (12): 1, K. Beard; 2, E. N. Baughan; 3, J. J. Brady; 4, F. G. Price. Grant Damos. Leaders best for size and shape. Commons not too bright. CATFISH (8): 1, J. B. Thompson; 2, Mrs. V. Butt; 3, E. N. Baughan; 4, Miss A. Addison. Quite a mixed bag which attracted much attention. PANGIAK (6): 1, K. Beard; 2, F. E. Woodall; 3, J. J. Brady; 4, Fenton. Leader by far the best for marking and shape, but all of good quality. GLASS FISH, RAINBOWS, ETC. (8): 1, J. J. Brady, *Badis badis*; 2, H. Warmley, Australian Rainbow; 3, H. W. Fennwood, *Badis badis*; 4, F. G. Price, Australian Rainbow. The leading *Badis badis* was far superior to the third prizewinner but there was not much in it between the two Australian Rainbows. DWARF & THICK-LIP GOURAMIES (True pairs) (9): 1, F. G. Price, Thick-lipped; 2, F. Jennings, Sr., Dwarf; 3, F. E. Woodall, Thick-lipped; 4, K. G. Sullivan, Thick-lipped. The one Dwarf in the cards was of very good order and did well to get 2nd place amongst the trio of high-class *C. labiosa*. A.O.S. ANABANTID (18): 1, Mrs. J. Bowyer; 2, A. Beardley; 3, F. W. Walker; 4, A. Beardley. Attractive Blue Gourami leading two Paradise Fish which gained 2nd and 4th places with a lead in between. The last mentioned was a fine male in colour and could on this occasion have been called more appropriately by its alternative name of Pearl Gourami. SIAMESE FIGHTERS (Male) (18): 1, L. Calver; 2, K. Beard; 3, L. W. Male; 4, B. Beestren. A strong class which caught the public eye with specimens displaying their colour and finnage well. Leader nearest to standard both for colour and finnage development. A. S. CICHLID (One fish) (32): 1, H. C. Warmley; 2, N. B. Crump; 3, G. Burwell; 4, H. W. Fleetwood. 1. Finest mouth of such good quality as to merit well the award of best tropical fish in show; large and colourful. Followed by Angel of good shape. Egyptian Mouthbreeder

in 4th place might have gone up one. GUPPIES (Two males) (4): 1, G. M. Davis, good size and colour, with caudals getting near to Veiltail shape; 2, A. Fenton, Top-sword and Roundtail types; 3, Heath, two fair quality Roundtails; 4, Fenton, Top-sword and fair quality Roundtail. GUPPIES (Two females) (8): 1, L. N. Baughan; 2, A. Fenton; 3, A. Fenton; 4, H. Fleetwood. Leading couple well in advance for size and shape. BLACK MOLLIES (True pair) (8): 1, P. T. English, well-matched dense colour, male showing best dorsal in the class; 2, Mrs. T. Webb, not quite the colour or size but a good pair for breeding; 3, J. J. Brady; beaten quality and colour, female here deserves bigger male with better finnage; 4, Mrs. T. Webb, points lost on colour and shape. A.O.S. MOLLINIENIA (True Pair) (8): 1, F. Finch, outstanding Sailfin; 2, J. J. Brady, Sailfin, not quite the dorsal development; 3, Heath, Sailfin, beaten size and shape but of good colour; 4, Baxter-Gilbert, very neat Speckled but smaller all round. PLATIES (True pair) (2): 1, F. E. Woodall, good quality Lemon Wagtail; 2, E. N. Baughan, Red Wagtail, of good colour but not the size; 3, A. W. H. Row, small Speckled, good condition; 4, J. J. Brady, neat Comet markings. SWORDTAILS (True pair) (16): 1, G. M. Davis, Albino of good size, although male could have had longer caudal extension; 2, A. W. H. Row, well-matched pair of Berlins; 3, Mrs. V. Butt, Greens good shape and size but fair colour; 4, J. J. Brady, Albino, small, but of good shape and quality. A.S. CHARACIN (One fish) (Open to non-first prizewinners at previous open shows) (15): 1, H. G. Bowyer, good quality Swordtail Characin; 2, A. Fenton, *H. maculatus*, good shape and size with well defined dorsal marking; 3, K. G. Sullivan, medium sized *Nannostomus anomalus*, showing lateral band very clearly; 4, M. H. Dellington, *H. flammula*, good red fish with distinct black marks. A.S. DANIO OR BRACHYDANIO (One fish) (Non-first prizewinners at previous shows) (12): 1, E. Ragnall, very shapely Zebra; 2, K. G. Sullivan, large Pearl, good colour; 3, W. Jenkins, another Pearl not quite so shapely; 4, C. Griffiths, Zebra of good shape and marking but not quite the size. A.S. BARB (One fish) (Non-first prize

winners at previous shows) (12): 1, A. Beardley; 2, L. W. Male; 3, D. A. Attevell; 4, A. Fenton. Nice trio of Rosy Barbs close together, followed by a good, but rather small, *B. schuberti*. A.S. LIVEBEARER (One fish) (Non-first prize winners at previous shows) (25): 1, D. A. Attevell, shapely Green Sword of good colour; 2, P. T. English, Black Mollie with reasonably good colour but could be better shape; 3, N. B. Crump, Lemon Wagtail, of sound colour but fair caudal; 4, K. G. Sullivan, Red Wagtail, not quite the size though shape and colour good. A.S. BETTAS OR GOURAMIES (One fish) (Non-first prizewinners at previous shows) (15): 1, J. B. Thompson, Three-Spot Gourami, of good size, but body spots not outstanding; 2, F. Kennard, Loeri Gourami of nice shape and size but uneven mosaic; 3, K. Beard, another promising fish, beaten condition; 4, C. Griffiths, close up with a Dwarf Gourami of good colour. FURNISHED AQUARIUM (INDIVID.) (4): 1, G. Phillips (76 points); 2, A. T. Burden (68); 3, E. N. Baughan (60); 4, H. C. Warmley (51). A quartette of set-up aquaria which showed good promise, the leader winning on choice of fish and plants. In this class some coldwater plants were used resulting in the loss of points and one tank had an ingenious design with the body of an octopus printed on the background, its arms protruding across the top of the compost to the front part of the aquarium. FURNISHED AQUARIUM (INTER-SOCIETY) (7): 1, Wolverhampton A.S. (79 points), a well deserved win with a heavily planted tank and not too much rockwork. Rosy Barbs and Black Widows were active occupants; 2, Shirley A.C. (74 points), quite a mixed bag here with Angel Fish, Giant Danio, *Bubus tetrazona*, Swordtails, Platies, and Zebra Fish, swimming happily amongst some healthy looking plants. As in the first tank, however, the actual planting could have been improved to overcome appearance of sparseness; 3, Walsall A.S. (72) Rosy Barbs, Mollies, Sword-tails and Neons, were in good evidence here but, although the planting was good, the rockwork did not blend well with the compost; 4, Midland A. & P.S. (66). A good effort with Platies, Mollies and Barbs but failed in execution and general design.

Club Notes and News

CAPT. L. C. BETTS visited the **Eritrh Aquarists** on Nov. 13, and spoke on "Coldwater fishkeeping" at a recent meeting club members with the Greenside A.S. Eritrh was held in the hall. The A.G.M. will be held during December.

MEMBERSHIP of the Merton L.T. Garage A.C. is open to employers at Merton and surrounding garages. Meetings are held on first and third Mondays of each month. Two members of the Lotus Club answered questions at a recent meeting, and Miss Palmer has given a lecture on "Plant Life and Ponds and Aquaria." The secretary is Mr. A. W. Drivers, 45, Highways House, Nightingale Lane, London, S.W.12.

IN co-operation with the local **Fur and Feather Society, Stirling A.S.** staged an exhibition on Nov. 21-24.

MR. A. SNEEDON, a junior member of the **Sussex A.S.**, won several prizes at the annual show of Ulver A.S. The society's furnished aquarium came third in its class at the same event.

NEW secretary of **Tunton A.S.** is Mr. G. R. Pals, 25, Gifford's Crescent, Tunton. An exhibition, which was held in conjunction with Mal-Sussex A.S. attracted 10,000 visitors. Since then there have been larger attendances at the monthly meetings, two of which have been addressed by Messrs. Perrett and Brown. The Mal-Sussex Society has invited Tasman members to their annual dinner and so it has been decided to make it a combined function.

SECRETARY of Basill A.S., Mr. D. Jolliffe, 17, Albany Road, Bexhill, would like to hear from lecturers living in his area. Plans are being made for the society to put on a number of short lectures and, on Nov. 1, a number of short lectures were given to members. Five prizes were given to the winners. The winners were Mr. A. G. Giddup, V. W. W. W. J. C. Giddup and A. Harner.

A NEW treasurer, Mr. F. F. Beer, was elected at the A.G.M. of **South London Aquarists**. From Sept. 26-28 the society took part in "This Wembleton" Exhibition. A number of aquaria were on display, among them a 3 ft. one set up by Mr. R. H. I. Read.

OFFICIALS elected at the A.G.M. of **Scarborough (Skipton) A.S.** were Mr. A. Hodgson, chairman; Mr. L. C. Thompson, vice-chairman; Miss A. O. P. Fenlon, secretary and Mr. G. E. Lyon, treasurer.

THE Belfast A.C. has recently come into being and meetings are held on the second and fourth Thursdays of each month in Avoca Street Unionist Hall. The secretary is Mr. W. Neill, 65, Glenbank Place, Belfast.

Goldfish Society Notes

THE Goldfish Society of Great Britain is staging its annual show this year in conjunction with the Water Life show at Olympia on Dec. 6-8. An entry of nearly 160 has been received from the society's various sections in that Mr. W. W. Pearce has retained the secretaryship of the Kent & Surrey Branch due to business reasons, that the Herts and Sussex Branch visited Mr. C. F. Whitehead's establishment during the summer and that Mr. F. C. Porter-Cox, "Clouds Hill", 31, Devonshire Road, Bournemouth, No. Bath, Somerset, has agreed to become area secretary of the West Country section.

Intestate, Effra Parade, S.W.2. There were lectures and a general discussion during October and a table show for livebearers on Nov. 7.

AVERAGE attendance at meetings of **Portsmouth A. & F.C.** is 60. Mr. W. M. Meadows visited the society during October. "Aquatic Fishery" was the subject covered by Mr. E. W. Studley at the November meeting. It is anticipated that the club dinner will be held on Jan. 5.

WINNER of the Junior Guppy Cup at the September meeting of **E. London A. & F.A.** was Mr. Thomas. First prize were Messrs. F. Hutchinson, A. Davy, A. Hudson and W. Arrell. The Mutual competition between Mr. R. G. this year by Messrs. C. W. G. C. and Russell, Holland, was won by Mr. Mead. With 26 points compared with the society's 14. An aquarium has been presented to East Ham Memorial Hospital.

THE Greenwich A.S. now holds the inter-club of South East London and South Kent Association. The members of the society were entering the 1950 club of the Greenwich exhibition on Nov. 17.

"FEEDING and Breeding" and "Plans for the Pool and Aquarium" were the titles of lectures given by Messrs. W. L. Manselville and C. W. Hunt at meetings of **Coventry F. R. A.S.**

NEXT meeting of **Study A. & P.C.** will take the form of a Guppy table show. Messrs. Cavellon and D. Law have been recent lecturers and a film show has been put on.

THE last meeting of **Walthamston A.S.** was addressed by Mr. R. H. I. Read, who spoke on the "Maintenance and Breeding of Coldwater Fish."

"BREEDING and General Care of Angel Fish" were covered by Mr. Roberts when he spoke at the October meeting of **Uxton A.S.** The society displayed eight furnished aquaria at the Streetford Cage Bird Society's open show.

THE return table show contest between **Thames Valley A.S.** and **Surrey A.C.** was won by **Thames Valley**. The last section of the year was held on November 15 and the last table show (for Guppies) is scheduled for Dec. 6.

S.W. Aquarists' Societies' Association

MR. J. MARTIN, of Postypool, spoke on "Breeding Angels" at a meeting of S.W.A.S.A. in Bath on October 28. He said that in his opinion Angels made better parents if a third small Angel or two or three Guppies were present. He felt that if the parents were alone in the tank "they got bored". Mr. R. Foret Jones, also of Postypool, used film strips to illustrate his talk on "Aquatic Insects" by exhibiting aquaria to incognite friend and foe.

Mr. H. C. B. Thomas, secretary, points out that the speakers' list of the Association has proved of great value to local sections but it has been suggested that its scope might be widened. He appeals to anyone who is interested in fishkeeping and breeding, and especially in the chemical and physical properties of water, pond and fishbowl construction, genetics, etc. to write to him at 46, Woodley Road, Bristol 7, giving such details as foot extra to travelling expenses, and the area which can be covered. The S.W.A.S.A. area extends from Swansea to Chichester and from Bath to Penzance.

MEETINGS of **Clapham A.S.** are now held on alternate Wednesdays at St. Agnes Hall, Venn Street, Clapham. A table show for tropical livebearers was held on Oct. 31.

NEW officials elected at the A.G.M. of **Surrey A.C.** were Mr. A. Brien, chairman; Mr. R. Page, treasurer, and Mr. E. Phipps, 27, Albert Road, Kingston, Surrey, secretary.

JUNIOR section of **Leicester A.S.** now publish a quarterly bulletin entitled "Aquatic News". A lecture on "Fancy Goldfish" and a table show for these varieties were arranged for the October meeting of this section. The October and November meetings of the adult section were addressed by Messrs. C. W. Hyatt and T. C. Saville. There will be a film show in December and the A.G.M. in January.

CHAIRMAN J. Ayres spoke at a recent meeting of **Leves A.S.** on "Tank Making." He demonstrated his subject. This was followed by a discussion on alternative methods of heating.

RICHMOND Public Library is to receive a furnished aquarium from the **Richmond and Twickenham A.S.** Recent lectures have been given by Messrs. Cooper and Hoar of A.S.L.A.S.

OVER 2,000 people visited the annual show of **Bath A.S.**, which was opened by the Mayor of Bath. "Water Insects" will be the subject of Mr. Forest Jones' lecture at the December meeting.

RECENT activities of **Méropside A.S.** have included an outing to Charter Zoo, the annual dinner and dance, presentation of a tropical aquarium in the local children's hospital and talk by Mr. D. Fleetwood on his West African journey.

MEETINGS of the **Aqua-Art Club (South-western)** are now held fortnightly, in the permanent clubhouse at Queen Anne Street. October lectures were on "Plant Life" and "Scaring Egg-layers." The society's first annual carnival dance was held on Nov. 28.

WITH a membership of 36, **Walsford A.S.** was recently formed. Mr. R. Cass, 171, Kirkgate, Walsford, Yorks, is the secretary. On Nov. 8, Mr. G. W. Cooke addressed the members.

FOLLOWING the second annual show of **Woburn National A.S.** the judge gave his comments on the exhibitors at the monthly meeting on Oct. 3.

AT the September breeders' show of **A. Raftop A.S.**, Mr. Rowe took the prizes awards. All entries were re-reflected at the society's A.G.M.

TWELVE furnished tanks were displayed by **Ashton-under-Lyne A.S.** at the Ashton Horticultural Show. A tropical aquarium has been preserved to the Children's Ward of the local hospital. Table shows and quizzes are regular features of the society's meetings.

THE following officials were elected at the Oct. 5 meeting of **Brixton A.S.**—chairman, Mr. S. Collins; treasurer, Mr. R. Smith; show secretary, Mr. R. Ransford; and secretary, F. J. H. Seymour. 14, Beatchamp Road, London, S.W.11. Meetings are held every Friday (7.30 p.m.) at the Brixton Men's

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Club Notes and News

— continued —

MR. W. C. CLEVELAND spoke on "Plans" at a meeting of **Forest Hill A.S.** A table about for lovers has also been held when Mr. Whitlock took the first prize. Future lectures will be given, by Mr. L. Eldridge and Mr. P. Hewitt.

PRESIDENT N. W. Gilbert, of the **Shelley A.S.**, is to speak at a meeting of the local branch of **Tot H. M. W. L.** Mandeville speaks at the Society's November meeting.

THE Wimbledon A.S. staged a display in conjunction with the **Wimbledon Exhibition**. Mr. P. Hewitt has spoken to the Society on "Velvet Disease". The first "treasures" show is scheduled for December 1951, at a tropical table show judged by Mr. Whitlock.

A NEW Society has been formed in **Hampstead**, this is the **Gosport & Farnham A.C.** Meetings are held at **Hidbrook Primary School, Gosport Road**, on the first Thursday of each month. The secretary is Mr. A. Diller, 3, Wyth Lane, Boddington, Gosport.

ANOTHER new society is the **Pontefract A.S.**, which held its second meeting on Nov. 6, when there was an attendance of 15 members. "Aquarium Heating" was the

subject under discussion. Mr. R. W. Rhoads, 26, Horsfield, Pontefract, is the secretary.

ON Oct. 21, Hawker Athletic & Social Club formed an **Aquarist Section** with Mr. H. Pincombe, chairman, and Mr. H. J. Lambert, secretary. Mr. C. Wright has presented a challenge trophy for competition amongst members of this section.

MEMBERSHIP of **Graingemouth A.S.** stands at 26. Meetings are held monthly and at the last one there was a bring and buy sale.

SEVERAL interesting lectures have been listed by **S.E. Essex Junior A.S.** in recent months and there have also been a table show and an auction. The Society is arranging a visit to **Harringay Circus** and a social for the Christmas season.

A TABLE show and performance of the members of **Waltham A.S.** during October. There was a further table show and lecture on "Fish Diseases" by Mr. H. E. Morris during November. December activities consist of a table show on Dec. 7 and a party on Dec. 21.

MESSES H. C. B. THOMAS and **F. S. W. W. W.** are addressing the October and November meetings of **Postpond P. & A.S.** with "Causes of Death in Fish" and "Shows and Showing Fish" as their subjects. The Society's second annual show is

scheduled for November 10 and December 1. It will be held in the **Trevettin Institute**, Postpond.

ILL-HEALTH of Mr. G. White has resulted in Mrs. F. M. Inge, 31, Hensley Rd., Chislehurst, Epsingham, taking over the secretaryship of **Wimbledon City Aquarists**. Mr. J. O. Shaw spoke on "Labyrinthitis" at the November meeting and there he judged a table show for this type of fish.

THE Principles of Tropical Fishkeeping were covered by Mr. Kitchen when he spoke at the October meeting of **Leigh A.S.** (Lancs.).

MR. A. LEUTSCHER, B.Sc., secretary of the **B.H.S.**, spoke on "Foreign Amphibians and Reptiles" at the October meeting of **Bford A. & P.S.** He brought along several live specimens. A table show for "Fighting Fish" was won by Mr. A. P. Thomas. Mr. Thomas has won the home aquarist competition.

ANOTHER Society has been formed in **Preston**. This is the **Preston Aquarists Circle** and the secretary is Mrs. D. Crawford, Eastwood, Garrison Road, Fulwood, Preston.

MR. CLAXTON spoke on his visit to the **Montaco Aquarium** at the November meeting of **Kings Lynn A.S.** In addition to the second December meeting another is to be held in which a film show will be included.

Club Notes and News

— continued —

FOLLOWING the success of the **Dunstable A.S.** public show, it is intended to make this an annual event. Mr. and Mrs. C. Hammond have presented a carved plaque to be up for competition on a points basis at these fixtures. Messrs. Chapman and Pullin have lectured recently and table shows have been held. A library has been formed.

COLDWATER and tropical fish were shown by members of the **Midland A. & P.S.** in a display at the **Midland H. & F.R.A.** annual open show on Nov. 23-24. Mr. H. C. W. Warmley gave a practical demonstration of aquarium glazing at the October meeting.

MEMBERSHIP of **Pennance A.S.** now stands at 25. The Society produces a monthly news sheet and hopes to present a tank to a children's ward of the local hospital in the near future. Mr. F. H. Baxter, 23, Trecoate Terrace, Long Rock, Penzance, is the secretary.

THE **Norfolk & Norwich A.C.** staged its annual exhibition at St. Andrew's Hall on Nov. 23-24 in conjunction with the All-England C.R. Alliance Society of Norwich. Mr. S. T. Jolly is to speak on Dec. 7 and the A.G.M. has been fixed for Dec. 12.

NEWLY-FORMED **Bury A.S.** has a membership of 10, and meetings are held on the first Thursday of each month at Church House, The Wilde, Bury. There was a quiz at the October meeting and, in November, Mr. Luder spoke on "Secondary Sexual Characteristics in Fishes." The secretary is Mr. T. Adams, 7, Valley Drive, Watsham, Nr. Bury.

MR. D. T. KEMP, 2, Rollis Park Avenue, Chingford, B.A., is the secretary of recently inaugurated **Chingford Amateur A.S.**

ACTIVITIES of **Reading A.S.** have included a lecture by Mr. Hewitt on "Fish Diseases" and a showing of the **Harrow A.C. film**. Mr. G. Harvey will speak on "Breeding Goldfish in Japan" at the Dec. 4 meeting. This society provided a display at the annual show of the local **Cape Bird Society**, held during November.

TEN aquaria were staged by **Swindon A.S.** at their first exhibition on Oct. 17. The society is setting up three tanks in a local hospital.

MESSES. POOR and Booth, both of **Portsmouth A.S.** have spoken at recent meetings of **Byde A.S.** Their subjects were "Breeding Barbs, Zebras and Black Widows" and "Molluscs."

FIRST prizewinners at the Oct. 15 table show of **Wallase Aquarists** were Mr. J. Smith and Mr. J. Lunnon. A lecture from one of the **P.B.A.S.** speakers was heard on Nov. 10.

MR. A. BRIGGS showed films at a recent meeting of the **City of Salford A.S.** Mr. Warburton spoke on "Setting up an Aquarium" on Oct. 23. The society's first show is scheduled for March of next year.

AT the October meeting of **Blackburn A.S.** Mr. Legge spoke on "Furnishing Tropical Aquaria."

THE secretary of **Mid-Somerset A.S.** spoke on the West of England Home Service Children's Hour on Oct. 27. This was followed by another talk given during November. Mrs. Campion addressed the October

meeting on the subject of "Plants" and during November the society's annual dinner was held.

MR. L. WHITE was appointed chairman of the A.G.M. of **Ham A.S.** Other appointments were Mr. Bushnell, secretary; Mr. F. G. Odams, treasurer; Mr. Darriault, librarian and Mr. S. S. Evans, show secretary. December activities include a quiz on Dec. 6, a talk on "Reptiles" by Mr. J. Lester, Dec. 13, and a lecture by Mr. L. White on "Biology of Freshwater Livestocks," Dec. 20.

THE **West End A.S. (Newcastle-on-Tyne)** is holding its A.G.M. on Dec. 4. Members extend best wishes to the treasurer, Mr. A. Mitchell, who has now moved from their district.

MEETINGS of **Rotherham A.S.** are held fortnightly in the **Hare-Hounds Hotel**, Wellgate, Rotherham. Mr. C. Liggins spoke at the October 31 gathering. Secretary of this organisation is Mr. R. P. Newsum, 63, Pitt Street.

THREE were 20 tanks on show at the Oct. 6 exhibition of **North Birmingham P. & A.S.** Mr. W. L. Mandeville was the judge. This society now has six trophies which are up for annual competition.

MR. MATLEY, of **Bournemouth**, spoke on "Breeding Tropical Egglayers" at the October meeting of **Salsbury A.S.** The society has been asked to stage a display of furnished aquaria at a local cage bird event to be held in January.

THE address of Mr. D. C. Ingham, secretary of **Harratone A.S.**, is 77, Station Parade, Harratone, Mr. Hamilton, of Leeds, spoke at the October meeting.

AN instructive talk on "General Show Standards" was heard by **Oldham A.S.** at their October meeting. There was also a table show for **Siamang Fighters**. A further table show and lecture by Mr. Honeyball were the features of the Nov. 14 meeting.

MESSES. W. T. ALDERMAN and R. C. Citty spoke on "Gadgets" at a meeting of **N. Herts A.S.** The annual auction was held during November and the society's dinner is scheduled for December.

THE **Oldbury A.S.** are contemplating staging a display of fish with the object of creating interest in their area.

RECENTLY formed **Stonehouse A.S.** has Mr. K. J. S. Hammond, Poundfield, Verney Rd., Stonehouse, Glos., as its secretary. It meets on the second Tuesday of each month in the Stonehouse Community Centre.

MR. R. SMALLWOOD was presented with the **Albury Challenge Cup** for the best home aquarium at the October meeting of **Canterbury A.S.**

AT the first annual open show of **Keighley A.S.**, held on Oct. 11-13, there were 21 furnished aquaria and over 40 entries in the individual fish classes. Mr. G. W. Cooke was the judge. There was a table show for livebearers at the November meeting.

TITLES of lectures given at meetings of **Sheff A.S.** have included "Livestocks and Parasites," "Feeding," "Tank Glazing," "Livebearers," "Charaxes" and "Electrical Equipment." A quiz is held at each meeting.

DUE to increased membership, the meeting place of **Wallase A.S.** is now The Oak Room, Gaumont Cafe, Bridge Street. "Show Standards of Goldfish" was the subject covered by Mr. R. Headon when he spoke at the October meeting. This was followed

British Herpetological Society

AT the general meeting held at the **London Zoo** on October 20, a very interesting lecture was given by Dr. Hugh Con, the camouflage expert, on "Adaptive Coloration." The talk was a well-balanced mixture of camouflage as applied in Nature, and the use to which it can be put in modern warfare.

On October 22 the **London Group** met at the **Zoo** to discuss "Crocodiles." Great interest was shown in the **Reptile House** afterwards, when Mr. J. Lester kindly demonstrated the collection, ranging from veteran **George**, a **Mississippi Alligator** which has been there since 1912, to a baby **African Crocodile** which recently arrived, hatched on the journey by air to this country.

Next general meeting has been arranged for Saturday, February 2, commencing at 3 p.m. Dr. Maxwell Savage will speak on "The Breeding Habits of Frogs and Toads." The lecture hall, **British Museum (Natural History)**, Cromwell Road, London, S.W.7, is the venue.

by a coldwater fish show in November, judged by Mr. T. G. Sutton. Mr. H. Cadwallader speaks on "Equipment" at the Dec. 11 feature.

MR. PRITCHARD, of **Blackpool**, gave a talk on "Fishkeeping in Holland" at the October meeting of **Accrington A.S.** A table show was also held and the best six fish are to be shown against a similar number from the **Blackpool Society** in an inter-club show.

FOLLOWING the resignation of Mr. Metcalfe, Mr. Berry has taken over the position of show secretary to the **Nelson Aquarists**. Mr. W. Thorley spoke on "Beacon Fish" at the October meeting.

THE last public show of **Amersham Grove A.C.** was held on Oct. 13. The majority of lectures given at meetings are delivered by society members. At least one table show is held each month, the largest so far being one for livebearers, when 70 entries were on show.

"**BREEDING** **Glowlight Tetras**" was the title of a talk given by Mr. G. W. Cooke at the October meeting of **Huddersfield A.S.** There was a film show and table show for **Charaxes** at the November feature. During December the annual dinner will be held in **Haywood's Cafe**, and in January the A.G.M. will take place.

AT the Oct. 5 meeting of **Worcesterfield A.S.**, Mr. K. A. Waterman, B.Sc., gave a talk on "Water Insects." He also showed a film on the same subject. Twenty-nine members visited **Chesler Zoological Gardens** on Oct. 14.

THERE was a table show for **Labyrinth** at the Nov. 28 meeting of **Nottingham A.S.** and also a lecture on "Diseases of Fishes" by Mr. W. H. Cotton on the same evening. Next meeting is on Dec. 10.

THE **Rugby A.S.** has a new secretary. He is Mr. I. W. Collins, 26, Lawford Lane, Baton, Rugby.

MEMBERS of **Kingston A.S.** were entertained to a film show given recently by Mr. Henderson. He also spoke at this meeting.

THE new address of **Matteson A.S.** secretary, Mr. A. H. Bulmer, is 12, Harrington Road, Chiswick, W.4.

A PART from lectures from the usual speakers, Mr. W. Sica, members of **Canford A.R. & P.S.** have addressed some meetings. The two most recent ones were entitled "pH" and "Pond Water Circulatory Systems."

Club Notes and News—cont.

ON Oct. 27, the Dewsbury A.S. held an inter-club table show with the Huddersfield Society. This was won by the latter by 14 points to 4. A further table show was held on Nov. 8, with classes for Characins, livebearers and A.O.S. small egg-layers.

MEMBERS of Gravesend A.S. have visited Fernwood Aquariums and Nurseries Ltd. at Ashford. Recent activities included a quiz by Mr. D. Horner, a talk by Mr. R. Arbin and a series of lectures for beginners.

A CHRISTMAS social and party is to be held at the Round Hill Men's Club, Dartmouth Road, Forest Hill, on Dec. 15. This is organized by Sydenham & Fenge A.S. and admission is by ticket only. Anyone interested should contact the secretary, Mr. H. E. St. Ives, 71, Byne Road, Sydenham, S.E.26.

MEMBERS of Bolton A.P. & M.S. have recently visited the Chester Zoo.

AN interesting winter programme has been prepared by the Wandle A. & P.C. Their new clubroom is at The Plough, Beckington, Croydon. The next meeting is on Dec. 11.

TWO show tanks have been set up by the Aquarist Section of Smiths of England Athletic Club in the main canteen. At the Oct. 3 meeting there was a lecture, film show and fish auction.

THE design submitted by Mrs. Blown has been selected for the club badge of Bourne-mouth A.C. It incorporates a Seahorse.

AT the October meeting of the Guppy Breeders' Society (Eastern Counties Section) Mr. H. S. White gave a brief résumé of the annual show arrangements which this year is to be held in conjunction with the WATER LIFE exhibition. The first-ever G.B.S. breeders' show for standard and non-standard types was held on Oct. 2. In this competition Mr. Farmer won the Breeders' Achievement Trophy and Mr. W. Myers, the Doublesword Challenge Trophy.

IT was announced at the A.G.M. of Tyne-side A. & B.S. that the society now has 100 members. Members have heard talks on a wide range of subjects in the last few months.

MR. S. B. SCARGILL spoke at the fourth meeting of Loughborough A.S. His subject was "Livefoods".

THERE is now a society in Monmouthshire, entitled the Newport A.S. Secretary is Mr. F. B. Cooke, 5, Palmyra Place, Newport.

OVER one dozen tanks were staged by the Blackpool & Fylde A.S. at the National Chrysanthemum Society's exhibition held on Nov. 1-3 at Olympia, Blackpool.

A NON-COMPETITIVE exhibition is to be put on by Wombwell A.S. at the local cage bird society's show on Dec. 15. Any society in the district who could supply exhibits should contact the secretary, Mr. D. Walton, 70, Main Street, Wombwell. Next meeting is on Dec. 13.

MESSRS. J. ALFRED and S. Talbot gave talks at the October meeting of Bradford A.S. There was also a table show for Mollies. Cups and prizes won at the annual show were presented at the society's dinner on Nov. 12.

AT the A.G.M. of Watworth A.C. the following officials were appointed:—President, Mr. E. Auerbach; chairman, Mr.

Oxley; show secretary, Mr. Beaven; treasurer, Mr. Short and secretary, Mr. R. Cosham, 3, Calais Street, S.E.5.

NEW secretary of W. Bramwich A.S. is Mr. A. A. Beardsley, 202, Newcombe Road, Handsworth. At the November meetings there was a talk on "Scavengers" and a Brain Trust.

WELL-KNOWN naturalist, Mr. B. Vesey-W. Fitzgerald, has consented to become President of the N. Haas A. & P.C.

"PLANTS and Furnished Aquaria" was the title of a talk given by Mr. Birtwell at the Oct. 29 meeting of Rochdale A.S.

ACTIVITIES of Riverside A.S. have included a Home Aquaria Competition and a lecture and show covering Siamese Fighting Fish. Forthcoming events include table shows for Cichlids and Guppies and another for livebearers. Mr. Gloyd will also speak on "Artistic Aquaria".

OFFICIALS elected at the A.G.M. of Plymouath A. & P.S. were:—President, Mr. H. Woolcombe; vice-presidents, Messrs. W. G. Heath, W. Bickford, J. Harding, R. Churchill, E. Grigg; chairman, Mr. R. P. Ackland; vice-chairman, Mr. M. Sheard; treasurer, Mr. T. A. Coslett and secretary, Mr. M. Kitt, 48, Dale Gardens, Mutley. Twenty aquaria will be staged at the local Schoolboy's Exhibition from Dec. 27-Jan. 3. The first annual dinner will be held on Dec. 4.

IN conjunction with the High Wycombe C.B.S. show on Dec. 1, High Wycombe A.C. is to stage an exhibition of fish.

THERE were 200 entries in the B.T.H. Willenden Hobbies & Handicrafts Club (Aquarist Group) first annual show held during September. The judge, Mr. R. Rowe, gave a talk on the exhibits at the Oct. 1 meeting. Mr. Smith will speak at the Dec. 10 feature.

MR. T. G. WARBURTON spoke on "Evolution of Fishes" at a meeting of Preston Scientific Society (Aquaria Group) held at the beginning of October. A demonstration of setting up a furnished aquarium was given by Mildred Thompson at a further October meeting.

TWENTY-FIVE members were present at the inaugural meeting of Glasgow Northern A.S. which took place during October. The society has staged an exhibit in

F.B.A.S. Decisions

THE new constitution of the Federation of British Aquatic Societies was up for discussion at the November 10 General Assembly. Amendments and alterations suggested by the Executive Committee were accepted *in bloc*. Amendments from E. London A. & P.A. were unanimously accepted whilst one from Erith was defeated. Further amendments from Nottingham, Erith and Wembley will be discussed at the next Assembly. The Wembley proposal suggests a change of title to the "Federation of British Aquarists' Societies".

The good wishes for a speedy recovery were sent to Chairman P. S. Campkin, who was in hospital at the time of the meeting.

In the Judges' Committee's report Mr. J. H. Gloyd mentioned the resignation of Capt. L. C. Bette from that committee and announced that Mr. W. G. Phillips had been made temporary chairman. New standards are in preparation and these will be based on similar pointings to those recently adopted by the Guppy Breeders' Society (see page 298). A Judges' Conference, to which all judges will be invited, was agreed to for early 1952.

Guppy Breeders' Society

ALL the society's annual cup show trophies will be up for competition in the Guppy B.S. show held in conjunction with WATER LIFE Exhibition at Olympia, London on December 6-8. The November meeting was addressed by Mr. W. G. Phillips on "Standards, their Object, Framing and Application."

the inter-club furnished aquaria class at the Scottish Aquarium Society's annual show. Secretary of the club is Mrs. G. Ferguson, 149, Mansel Street, Glasgow, N.

TWO talks heard by Wimslow Guild A.S. were given by Messrs H. Ward and T. G. Warburton on "Garden Ponds" and "Fish Diseases," respectively. The secretary is now Mr. T. R. Lee, 30, Moor Lane, Wimslow.

LONDON ZOO Aquarium has been visited by members of Dalston A.S. A shield is now up for competition at each of the society's monthly table shows.

A DINNER for members and their wives has been arranged for Dec. 1 by Hornsey A.S. It is hoped to make this an annual event.

THE City of Ely A.S. held its first show during the holiday season and, although reasonably successful, attendance was impaired by torrential rain.

National Aquarists' Society A.G.M. Report

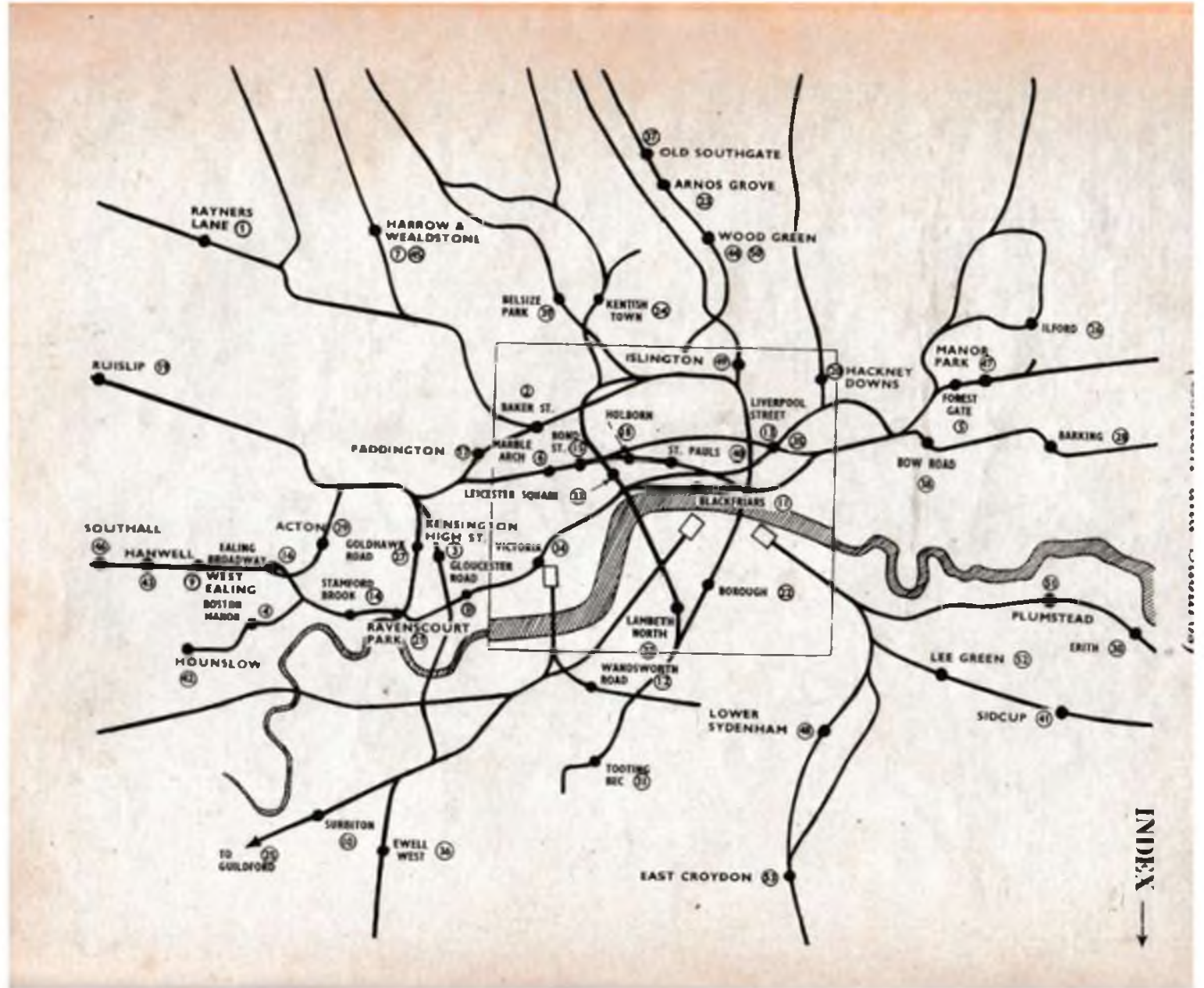
SEVERAL changes were made at the A.G.M. of the National Aquarists' Society on October 15. Mr. W. J. Page completed his term of office as President and, Mr. L. B. Katterns, vice-president succeeded in the chair. The treasurer, Mr. F. G. Odams was re-elected. Messrs. Bone and Gage were nominated vice-presidents and the former was elected by a majority vote. The new Council consists of Messrs. R. E. Churchman, A. W. Mary, G. W. Kingston, J. W. Watts, A. J. Marjoram, C. R. Macdonald, J. Wilson and W. Cleveland. Mr. F. W. Diwell, regretted that he could not continue in office as secretary owing to an impending move from the London area. Mr. D. G. Armstrong, 46, Ewhurst Road, Crofton Park, London, S.E.4, was elected.

Rule 7 was amended to allow the Council to consist as hitherto of eight members but omitting the clause which stipulated that three members of the Council should come from the provinces. This modification does not preclude the election in future years of provincial members to the Council but overcomes the difficulty of finding three members outside the London area willing and able to serve. The retiring President gave a review of the last year's activities and had pleasure in inviting the society to agree to the Council's

recommendation that Fellowships be awarded to Mr. R. J. Affeck and Mr. J. Carnell. He eulogised their services to the society and the voting in favour of awarding the Fellowships was unanimous.

The treasurer gave a comprehensive review of the society's financial position which revealed a loss on the trading account of the 1951 annual show. He very much regretted the loss but other members pointed out that the show must not be judged by its financial return. This view was reiterated by the incoming President, Mr. Katterns. Mr. Watts, on behalf of Mrs. Meadows and himself, gave the auditors' report and congratulated Mr. Odams on the excellent way in which he kept the accounts. Messrs. Watts and Diwell were appointed auditors for 1951-52. Mr. Carnell in addition to retiring from the Council relinquished his position as honorary librarian. It was agreed to re-affiliate to the F.B.A.S. At the November 12 meeting, Mr. H. N. Allies spoke on "Setting-up Furnished Aquaria".

We regret that an error occurred in the Scottish Fisheries advertisement appearing in our last issue. The Edinburgh address should have read 107-109, Broughton Street.



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RETAIL

- 1 **PETERS FOOD STORES LTD.**, Head Office, 464, Alexandra Avenue, Rayville Lane, Harrow, Stat. Rayville Lane, Tel. Pinner 5612-5.
- 2 **FISHTANKS**, 49, Mansford Street, W.1. Stat. Baker St. Tel. WEL 9412.
- 3 **LAKESIDE AQUATIC SUPPLIES**, 5, Kensington High St., W.8. Stat. Kensington High St.
- 4 **HANWELL PET STORES**, 11, Broadway Buildings, Boston Rd., Hanwell, W.7. Stat. Boston Manor, Tel. BAI 5028.
- 5 **LAKESIDE AQUATIC SUPPLIES**, 49, Edgware Road, Marble Arch, W.2. Stat. Marble Arch, Tel. Paddington 7916.
- 6 **HOOD'S AQUARIUM SUPPLIES**, 15, Upton Lane, Forest Gate, E.7. Stat. Forest Gate, Tel. GIRAwood 2207.
- 7 **WATFORD PET STORES**, 41, High Road, Watford, Herts., Mddx. Tel. Harrow 6862.
- 8 **PETS BEAUTY PARLOUR**, A. H. DAVIS, 1, Gloucester Rd., London, S.W.2. Stat. Gloucester Rd. Bus. No. 49. Tel. WES 5522.
- 14 **THE SURREY AQUARIA**, 11, Brighton Road, Sutton, Surrey, Stat. Sutton Bus. Trolley 601, 602, 603, 20. Bus 65. Tel. Elmbridge 6783.
- 11 **SWIFT AQUARIUM SUPPLIES**, 58-74, Ludgate Hill, E.C.4. Stat. Blackfriars, Tel. City 2905.
- 12 **SWIFT AQUARIUM SUPPLIES**, 799, Wandsworth Road, Clapham, S.W.8. Tel. MACcosh 5709.
- 14 **AQUA-TANKS**, 351, King Street, Hammersmith, W.6. Stat. Stamford Brook, Tel. Riverside 1297.
- 17 **PETERS FOOD STORES LTD.**, 6, Great Western Rd., Paddington, Tel. Cunningham 5303.
- 19 **BARRICON PET BUREAU**, 44, High St., Ruislip, Mddx. Stat. Met. Tel. Ruislip 1556.
- 20 **STATION GARAGE**, Hackney Downs Station, Dalston Lane, Hackney, E.8. Stat. Hackney Downs, Bus. 35, 38, 38a. Tel. Amhurst 6203.
- 21 **J. F. COOPER**, 204, King St., Hammersmith, W.6. Stat. Ravenscourt Park (Underground), Bus. 27, 19, 660, 665, 667, 668. Tel. Riverside 5197.
- 29 **PETERS FOOD STORES LTD.**, 175, High St., Acton, Stat. Acton, Tel. Acton 4693.
- 30 **FARRAIRNS AQUARIA LTD.**, M. High St., Erith, Kent. Stat. Erith.
- 42 **PETERS FOOD STORES LTD.**, 92, High Street, Hounslow, Mddx. Tel. Hounslow 9161.
- 43 **PETERS FOOD STORES LTD.**, 145, Uxbridge Road, Hanwell, Mddx.
- 44 **PETERS FOOD STORES LTD.**, 103, High Road, Wood Green, N.22. Tel. Rowes Park 1478.
- 45 **PETERS FOOD STORES LTD.**, 142, Station Road, Harrow, Mddx. Tel. Underhill 1771.
- 46 **PETERS FOOD STORES LTD.**, 41, King Street, Southall, Mddx.
- 47 **H. Y. LEFBURY & SONS**, 74, Station Road, Manor Park, E.12. Stat. Manor Park, Bus. 661, 25, 101.
- 48 **WILLIS & SONS** (Proprietors), 4, Willis, 347, Southend Lane, Sydenham, London, S.E.26. Stat. Lower Sydenham, Bus. 75, 108, 194 to Bell Green, Tel. Sydenham 4340.
- 49 **FRED ASHPOLF**, 15, Green Lanes, Newington Green, Islington, N.16. Bus. 641, 73. Tel. Cannonbury 6575.
- 50 **G. E. FINNETT**, 309, Lordship Lane, Tottenham, N.17. Stat. Wood Green Tube, Tel. TOT 5170-1413.
- 51 **WORTHWHILE PET STORES**, (S. A. Parks), 90, Plumstead High St., Plumstead, London, S.E.18. Stat. Plumstead, Bus. 99, 122, 696, 699.
- WHOLESALE & RETAIL**
- 9 **THE BIRD SHOP & AQUARIA**, 1, The Avenue, West Ealing, W.13. Stat. West Ealing, Tel. Perivale 0777.
- 12 **J. W. AGANS**, 20, Cheshire Street, E.2. Stat. Liverpool St. Tel. Bishopsgate 9180.
- 15 **AQUARIUM SUPPLIES LTD.**, 16, Picketon Place, W.1. Stat. Bond St. Tel. WEL 0410.
- 16 **THE PET SHOP**, 12, Spring Brider Rd., Ealing Broadway, W.8. Stat. Ealing Broadway, Tel. Ealing 3250.
- 18 **CITY AQUARIA**, 76, Red Lion St., High Holborn, W.C.1. Stat. Holborn, Tel. Chancery 3605.
- 22 **GARDEN AQUATICS & AQUARIA CO.**, 47, Great Guildford St., Brough, N.E.1. Stat. Brough, Tel. Waterloo 4194.
- 23 **W. T. JEFFERIES**, 4, The Broadway, Inver Barrow Rd., N.11. Stat. Amos Grove, Tel. Enterprise 2829.
- 24 **K. T. AQUARIA**, 16a, Highgate Rd., Kentish Town, N.W.5. Stat. Kentish Town, Tel. Gulliver 2262.
- 25 **MELLYN'S AQUARIUMS**, Downhurst, Eghurst, Surrey, Stat. Guildford, Tel. Eghurst 46.
- 26 **T. NORTH**, 217, Ilford Lane, Ilford, Essex, Stat. Ilford.
- 27 **QUEENSBOROUGH FISHERIES**, 131, Goldhawk Rd., St. Pancras, W.11. Stat. Goldhawk Road, Tel. Shepherds Bush 2710.
- 28 **RELIANCE AQUARIA CO.**, Reliance Works, Tenney St., Bathing House, Stat. Bathing, Tel. Rugeley 2834.
- 31 **SOUTH WESTERN AQUARISTS**, 2, Glenburnie Rd., Trinity Rd., S.W.17. Stat. Tooting Bee Tube, Bus. 49, 19. Tel. BAL 7314.
- 32 **SOUTHBANK LIVESTOCK & SEED SUPPLY**, 112, Lambeth Walk, S.E.11. Stat. Lambeth North, Tel. Reliance 3592.
- 33 **ST. MARTIN'S AQUARIA**, 11-13, Molesworth Street, W.C.2. Stat. Leicester Square.
- 34 **TACHBROOK TROPICALS**, 744, Vauxhall Bridge Road, Victoria, S.W.1. Stat. Victoria, Tel. Victoria 5179.
- 35 **BUDD'S AQUARIA SUPPLIES**, 7, Devonshire Row, Bishopsgate, E.C.2. Stat. Liverpool St. Tel. Bishopsgate 6711.
- 36 **WEST EWELL AQUARIA**, 18, Fudge Road, West Ewell, Surrey, Stat. Ewell West, Tel. Ruell 6740.
- 41 **SHERWOOD PET STORES OF SIDCUP**, 152, Sherwood Park Ave., Sidcup, Kent, Stat. Sidcup, Tel. Bealesbeath 7217.
- 52 **J. NORTH (LONDON) LTD.**, 118, Lee High Road, Letcham, S.E.13. Stat. Lee Green, Tel. Lee Green 3577.
- 53 **THE AQUARIUM**, Edgware, at Croydon, Kennards Arcade, North End, Croydon, Surrey, Stat. East Croydon, Tel. CRO 4455. Bus. 21.
- WHOLESALE**
- 18 **WEST LONDON AQUARIA LTD.**, 14, Sicilian Avenue, W.1. Stat. Holborn, Tel. HOL 0210.
- 20 **CASTANG**, 91, Haverstock Hill, Stat. Bellet's Park, Tel. Penton 1842.
- MANUFACTURERS**
- 37 **ANGEL ELECTRICAL INDUSTRIES LTD.**, Chelmsford Road, N.14. Stat. Old Southgate, Tel. Palmers Green 2911.
- 38 **SPRATT'S PATENT LTD.**, 41-47, Bow Road, London, E.3. Stat. Bow Road, Tel. Advance 4891.
- DISTRIBUTORS**
- 11 **TROPISCHE FISCH & BYPASS-SEND**, 21, Bride Lane, Fleet Street, E.C.4. Stat. Blackfriars, Tel. Central 1929.
- 40 **FRANZONI (LONDON) LTD.**, 44, St. Paul's Churchyard, E.C.4. Stat. St. Paul's, Tel. City 5954.
- 40 **EXOTIC TRADE (NATURALISTS) LTD.**, 44, St. Paul's Churchyard, E.C.4. Stat. St. Paul's, Tel. City 4954.

Christmas Shopping Guide

Aquaria Stores, Pet Shops and Emporiums, who are stockists of a wide variety of aquaria requisites and other livestock accessories and appliances, suitable for seasonal gifts.

ASHTON-UNDER-LYNE

Henry Wilde,
80 & 82, Warrington St., Ashton-under-Lyne, Lancs. Stat.: Charles-town. Tel. Ash. 2364.

BASINGSTOKE

Arnould,
30, Pardon, East Oakley, Basingstoke. Stat.: Basingstoke.

BIRMINGHAM

Stuart Erskine,
Weaman Street, Birmingham, 4. Stat.: Snow Hill. Tel. Central 5997.

H. Morris & Sons Ltd.,
1161, Warwick Road, Acocks Green. Tel. Aco. 0297. Bus Service: Blum City Centre.

H. Morris & Sons Ltd.,
174, Albert Road, Stechford. Tel. Ste. 2010. Bus Service: Birmingham City Centre.

H. Morris & Sons Ltd.,
207, Ladypool Road, Sparkbrook. Bus Service: Birmingham City Centre.

H. Morris & Sons Ltd.,
681, Stratford Road, Sparkhill. Tel. Spr. 2790. Bus Service: Birmingham City Centre.

H. Morris & Sons Ltd.,
554, Green Lane, Small Heath. Tel. Vic. 0073. Bus Service: Birmingham City Centre.

H. Morris & Sons Ltd.,
488, Dudley Road, Rotton Park. Bus Service: Birmingham City Centre.

H. Morris & Sons Ltd.,
163, High Street, Harborne. Tel. Har. 1212. Bus Service: Birmingham City Centre.

Joseph Sanley Ltd.,
17, Smallbrook St., Birmingham, 5. Stat.: New St. Tel. Midland 3354.

Shirley Aquatics Ltd.,
Monkspath, Stratford Road, Shirley, Birmingham. Tel. Shirley 1300.

BISHOP AUCKLAND

E. M. Herdman,
137, Newgate St., Bishop Auckland. Stat.: Bishop Auckland.

BRAINTREE

L. G. Goodwin Aquaria Dept.,
21, Rayne Rd., Braintree. Stat.: Braintree. Tel. 430 ext. 3.

CHESTER

Poultry & Pet Food Stores,
46-48, Upper Northgate St., Chester. Tel. 21919. Stat.: General. Bus Service: Crosville.

CHICHESTER, SUSSEX

Chichester Aviarics,
Whyke Lane, Chichester, Sussex. Stat.: Chichester. Tel. Chichester 3751.

Southern Aquaria,
17, Broyle Rd., Chichester, Sussex. Stat.: Chichester. Bus Service: 59, 60, 68. Tel. Ch. 2158.

DARLINGTON

G. R. Metcalf,
2, High Northgate (near Regal Cinema), Darlington. Stat.: Darlington. Bus Service: On Great North Road. Tel. 5991.

DERBY

Syd Sharrock,
128, Park St., Derby, (30 yards from Midland Station). Stat.: Midland Rd. Tel. 48982. Branch: Aquaria only.

G. W. White,
16, Curzon St., Derby. Stat.: Derby. Tel. Derby 44978.

DORKING, SURREY

L. Haig & Co. Ltd.,
Beam Brook, Newdigate, Nr. Dorking, Surrey. Stat.: Holmwood. Bus Service: 429 (1 mile). Tel. Norwood Hill 51.

EDINBURGH

Aqua-Tanks,
85, Shandwick Place, Edinburgh. Tel. 26332.

Aqua-Tanks,
46, South Bridge, Edinburgh.

GLASGOW

Angling and Aquarium Supplies,
207, Hope Street, Glasgow C.2. Stat.: Glasgow. Bus Service: Glasgow. Tel. Douglas 0825.

GUILDFORD

Guildford Pets Stores,
Bridge Street, Guildford, Surrey. Tel. Guildford 3569. Stat.: Guildford. Bus Service: Past door, All services & Green Line.

Wingate,
8, Guildford Park Road, Guildford. (Adjoining S.R. Station). Tel. 62725.

GRAVESEND

Gravesend and Medway Aquaria,
Princes Street, Gravesend. Tel. Gravesend 1883. Stat.: Gravesend Central. Bus Service: Central Town.

HARROGATE

Harrogate Aquaria & Pet Shop,
77, Station Parade, Harrogate. Stat.: Harrogate. Tel. Harrogate 4889.

HULL

Kingston Aquatics,
339a, Beverley Road, (opposite Mayfair cinema), Hull. Tel. Cen. 17801. Stat.: Paragon. Bus Service: 63, 17, 21.

ILFRACOMBE

North Devon Aquarium Supplies,
Watermouth, Ilfracombe, Devon. Stat.: Ilfracombe. Bus Service: 104. Tel. Ilfracombe 636.

IPSWICH

R. Davidson,
No. 7, Bramford Road, Ipswich. Stat.: Ipswich Town. Tel. Kirton 212 (Suffolk).

Shufflebotham, J.,
41, Stanley Avenue, Ipswich, Suffolk. Stat.: Derby Road. Bus Service: Tram 2 or 5.

LINCOLN

The Elmdale Aquarium,
112, High Street, Lincoln. Stat.: Lincoln. Bus Service: On main bus route.



Shopping Guide—continued



LIVERPOOL

The Liverpool Aquaria Co.,
1, Dawson St., Whitechapel, Liverpool
1. Stat.: Lime St. or Central. Tel.
Royal 7426.

LONGTON

F. W. Walters,
Normacot Fisheries & Pet Store, 39,
Urtoxeter Rd., Normacot, Longton,
S.-on-T., Staffs. Stat.: Normacot. Bus
Service: P.M.T.

MANCHESTER

Letty Kremner,
66, Cheetham Hill Road, Manchester 4.
Stat.: Victoria. Bus Service: 35, 4, 59,
60, 62, 75, 81. Tel. Blackfriars 2163.

Walter R. Smith,
39, Tib, St., Manchester. Stat.: London
Rd. or Victoria. Tel. Deansgate 2961.

NEWCASTLE-ON-TYNE

Whitfield's Pet Stores,
33, Clayton St., Newcastle-on-Tyne.
Stat.: Newcastle-on-Tyne. Tel. 22540.

NOTTINGHAM

"Ernies" Aquarist Shop,
121-123, Denman Street, Nr. Radford
Baths, Nottingham. Tel. 74361. Stat.:
City. Bus Service: 43.

Tom C. Saville Ltd.,
9, Station Rd., Beeston, Nottingham.
Stat.: Beeston. Bus Service: Nottm.
Corpn. 4 & 5. "Barton" 5. "Midland
Red" X99. Tel. 55655.

PAIGNTON

C. F. Crocker,
Paignton Livestock, 26, Hyde Road,
Paignton, Devon. Stat.: Paignton.
Tel. 57061.

PARKSTONE, DORSET

South Coast Aquatics (Parkstone),
443, Ashley Rd., Parkstone, Dorset.
Stat.: Bournemouth West. Bus Service:
4, 5, 5A & 10. Tel. Parkstone 3521.

PLYMOUTH

E. H. Grigg,
Torpoint Aquatic Supplies, Alma Rd.,
Plymouth. Stat.: North Rd. Bus
Service: 5, 10, 14, 12, 17, 19, 26, 32,
from City centre or Station.

PORTSMOUTH

Southsea Aquarium,
South Parade, Southsea. Stat.: Ports-
mouth. Bus Service: From Town
Station. Tel. Portsmouth 32275.

J. W. Taylor,
Arundel Aviarics & Fisheries, 213,
Arundel St., Portsmouth. Stat.: Ports-
mouth & Southsea. Bus Service: D
Bus.

PRESTON

Geo. F. Bowman,
Three Tuns Hotel Yard, 116, North
Road, Preston. Stat.: Preston. Bus
Service: Ribble.

Hall's (Livestock Specialists),
70-70A, Church Street, Preston. Tel.
Preston 56475. Stat.: Preston.

SHEFFIELD

Pets & Gardens,
26, Hereford St., Sheffield, 1. Tel.
20397.

John Hutchinson,
90, West Ear, Sheffield, 3. Stat.:
Sheffield L.M.S. Tel. 27350.

SMETHWICK

H. Morris & Sons Ltd.,
Endurance Mills, Windmill Lane,
Smethwick. Tel. Sme. 0055. Stat.: New
St., Birmingham. Bus Service: Most
from Edmund St. Birmingham.

H. Morris & Sons Ltd.,
110, Cape Hill, Smethwick. Tel.
Sme. 0055. Bus Service: Birmingham
City Centre.

H. Morris & Sons Ltd.,
423, Bearwood Road, Smethwick.
Bus Service: Birmingham City Centre.

SOUTHAMPTON

"Aquariums",
54, St. Mary's Rd., Southampton,
opposite Fire Station. Stat.: Southamp-
ton Central. Bus Service: 12 & 13.

ST. ALBANS

Watford Pet Stores,
(Head office), 66-68, London Road,
St. Albans.

ST. HELENS, LANCs.

Wm. Owen & Sons,
35 & 40, Westfield St., St. Helens.
Stat.: Central Station. Bus Service:
Liverpool Bus stops 20 yards from door.
Other town Buses 3 minutes from
termini. Tel. 2626.

STOCKTON-on-TEES

Smith's Pet Stores,
66, Norton Road, Stockton-on-Tees.
Stat.: Stockton. Bus Service: 0, 6, 2.

SWINDON

Domestic Pet & Aquarist Stores,
Cromwell Street, Swindon, Wilts. Tel.
Swindon 3974. Stat.: Swindon.

WATFORD

Ivor N. Newman,
71-71a, Queens Road, Watford. Tel.
Wat. 2750. Stat.: Watford Junction.
Bus Service: All services from High St.

Watford Pet Stores,
177, St. Albans Road, Watford. Tel.
Watford 6611.

WINCHESTER

Wingate,
De Lunn Buildings, Jewry St., Win-
chester, Hants. Stat.: Winchester City.
Bus Service: All local routes. Tel. 2406.

WOLVERHAMPTON

Smith's Pets Foods Ltd.,
18, Broad St., Wolverhampton. Stat.:
G.W.R. Wolverhampton. Bus Service:
All to Town. Tel. 21376.