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the

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and Pondkeeper



the *Aquarist*

and Pondkeeper

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The Editor accepts no responsibility for views expressed by
contributors.

Editor: Laurence E. Perkins

B.V.C. blowers for aquaria

*High reliability
and economic
operation*



Inter-Pet Director Mr. A. Lambart (left) and Manager Mr. M. Cobbett working in a corner of the Newdigate premises. In the foreground is the compact B.V.C. Model Z4 blower which supplies air to 250 of the tropical fish tanks.

AERATING the water in tropical fish tanks is one of the many important and essentially efficient applications of blowers produced by B.V.C. Engineering Ltd., of Leatherhead, Surrey.

Inter-Pet Fish Supplies, one of the leading tropical fish specialists in the U.K., imports many species of fish for distribution in the Home market, but at the same time exports fish and equipment to many other countries. At its Newdigate premises, the company has installed a B.V.C. Model Z4 blower unit driven by a $\frac{1}{4}$ h.p. motor. This has proved adequate to supply 250 standard-sized tanks with a constant flow of clean air.

Use of the blower gives a non-pulsating flow of air, which is absolutely free from oil or carbon and is self regulating to give a constant correctly balanced volume related to the requirement of each individual tank.

At Newdigate, the efficient supply of air at low pressure has allowed a greatly simplified pipework system to be used, dispensing with silencers and pressure relief valves. The output of the blower is taken through polythene tubing of standard sizes, but selected and distributed to a designed layout, terminating in standard small bore (4 mm) points to each tank. Simple screw-type polythene valves are installed at various points for adjustment of air volume as necessary; these adjustments do not affect the efficiency of the blower. An important factor of this system is that, in the event of a leakage of air on any branch line, the air

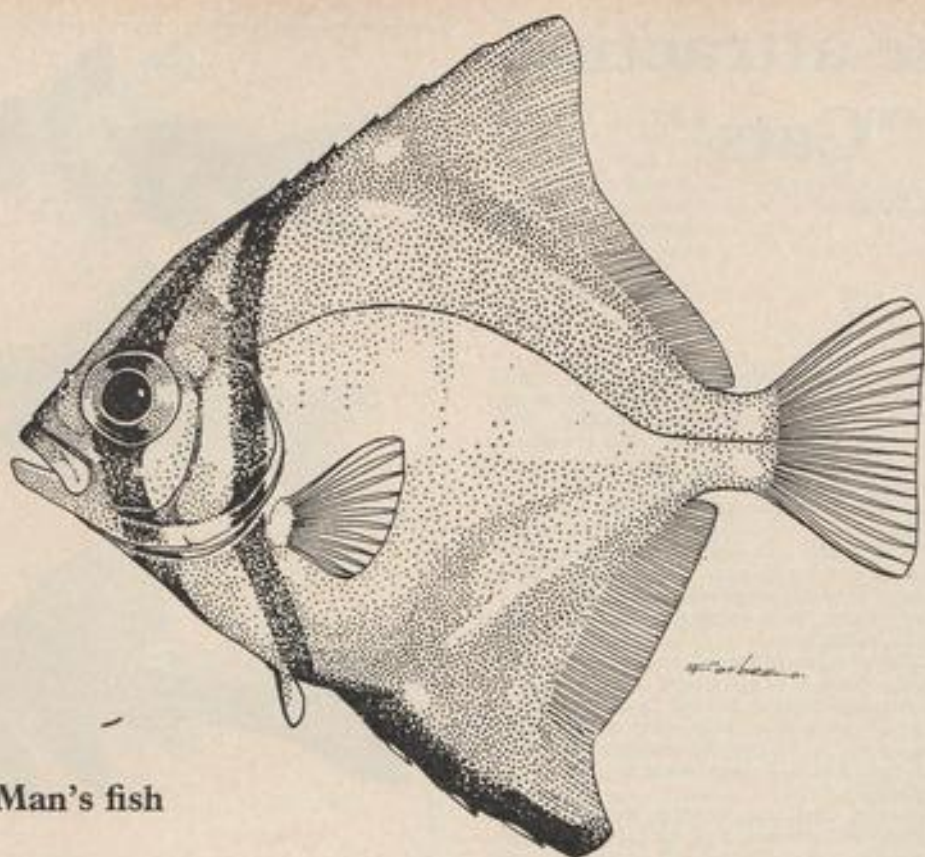
supply to the rest of the tanks is not cut off but is automatically compensated to maintain a constant flow.

With a throughput of hundreds of thousands of fish per year, the tanks are always stocked with various species of fish delivered from all over the world, demanding careful treatment during the critical period of acclimatisation. Thus it is imperative that an efficient, constant clean air supply is maintained at all times.

Another advantage is the compact size of the Z4 blower. Its free-standing baseplate greatly simplifies on-site installation—no holding down bolts are required. Inter-Pet mounted two units in a small area of roof space in the main building, arranging this so that a switch over could be effected to carry out routine maintenance.

So far the only maintenance required has been the occasional adjustment or replacement of a drive belt. "The trouble is," says Inter-Pet director Arnold Lambart, "the installation is so reliable we never remember to look at it until a belt does finally break." But in this event it takes only a matter of moments to switch over to the second machine, so service can be carried out at leisure without fear of harm to the fish.

Due to the reasonable cost, reliability and low noise level of the Z4, an increasing number of pet shops throughout the U.K. are modifying their existing plant by the installation of one of these blowers. Larger models from the B.V.C. range are also supplied to aquaria in zoological gardens, large pools and aquatic nurseries.



One Man's fish

Monodactylus argenteus

by David Carl Forbes

THE TINY EARTHWORM thrust and wriggled on the gravel, and then, from the dark between the big stones in the corner of the tank, there came a movement. A *Monodactylus*, its flanks still dull from skulking in the darkness, came out into the bright light and hovered; just the pectorals quivered and the movement was pure economy. With the light its colour came back, the silver flanks merging into yellow at the fins and the black bands vivid in contrast. It moved closer to the gravel, paused awhile with great eyes myopically surveying the scene and then, in a flash of silver, the worm was gone.

Monodactylus argenteus is vertically compressed, but sturdy and compact. It is economically built, flat but solid, with nothing for show, and scales extended out on to the rays of the fins. It looks a contemporary fish, metallic and seemingly design centre-finished, and one almost

expects to find pennant numbers on its flanks. If there were an F. One-eleven among fish, this would surely be it. One will agree that it basically resembles the angels, but merely basically, and the angel fish by comparison is Victoriana in trailing fins.

The Monodactylids come from tropical saltwater, working their way from the estuaries up into freshwater, and the nets, and how long they will maintain good condition in pure freshwater is perhaps a matter for speculation. In my tank, the gradual addition of salt sustains the fish, and they thrive, eat lustily, and grow to substantial size. They are fish for the specialist—mine share space only with a dwarf flounder, for they are, at best, mercenary by inclination. I have never seen them use the sharp spines which lay along the leading edges of their fins, but few small fish are safe from their voracious feeding jousts.

The attraction of "Cats"

by Bill Simms

THE QUEER SHAPES and movements of the various tropical cat-fishes are most attractive, and the demand for at least one peaceful "cat" in an aquarium is understandable. Some of the kinds that mix peacefully with other inmates are usually available and their quaint charm has persuaded many aquarists to concentrate on seeking other kinds.

There are many species now available though a few come to us in small numbers only. Some of these cat-fishes do look somewhat similar but among them are sufficient differences for a choice to be made. I have picked out six to show some of these differences of form and marking.

Corydoras arcuatus has a number of common names. Streamlined Cat-fish is one, and Skunk Cat-fish is an American alternative (possibly because the black and white animal called a skunk is so well known over there). The habits and shape are similar to those of the common bronze cat-fish, but the colouring is pearly-white marked with a distinct black line. It is a typical *corydoras*, mixing freely with others of its kind and never giving any trouble in a community tank.

Many aquarists think that the most attractive of the *corydoras* group is *C. punctatus julii*, the Leopard Cat-fish. It is certainly a prettily marked fish and one that is usually agreeable in its temperament, but in my view the appearance of the previous fish—the Skunk Cat-fish—is more distinctive in any aquarium.

A rather larger cat-fish, which grows to about 6 inches and therefore can be kept in larger aquariums with big fish, is *Leiocassis siamensis*. This is one of the species that is hard to obtain at times; this is a pity because its colouring is both pretty and striking. The light parts are a faintly pink-cream colour and against this background the very dark grey bands show up clearly. It is said that the female has a reddish tail though I have never seen this.

L. siamensis does not have the armoured scales we see so clearly on the *corydoras* species, and both barbels are much longer. The more slender shape of this fish gives it a more streamlined appearance.

The Whip-tail Cat-fish, *Loricaria parva*, is fully armoured with bony plates and it has a big head that contrasts strongly with its slender shape extending into the whip-tail. The colour is yellowish-brown marked with darker blotches and bars and is very variable. During much of the day *L. parva* is to be seen stuck fast to a stone or to the glass of the aquarium; but in the evening it becomes much more active. Algae and the soft parts of plants form the bulk of its food, but it also roots about on the bottom, consuming edible parts of the detritus there.



Another sucker cat-fish is *Otocinclus vittatus*, which has a variable type of mottled colouring with a denser stripe along its middle. This fish is fairly small and has become quite popular in aquariums because of its peaceful habits. Because the mouth is below the head there is little evidence of "cat" tentacles in this fish.

For the "cat-lover" who fancies trying a really big fish, there is *Plecostomus commersoni* which grows to about 15 inches. It is rather ordinary in colour, being grey-brown, mottled and barred with darker marks, but its charm lies in its ability to suck on to anything so strongly that it is hard to separate from that object.

A larger tank, with no plants, and plenty of large stones, is recommended for all of the big cat-fishes but most of them require large quantities of vegetable food although they are omnivorous and take live food as well. But whether you have a pair of big ones on their own, or include some of the smaller kinds in a community tank, you can find plenty of variety among the many kinds of cat-fishes.

I.M.S.S. v F.B.A.S.

We NOTED with interest the reply by the F.B.A.S. to our letter on Standards for Marines (*Aquarist*, May) and although they have in fact still left unanswered two of the original three points raised, they have added to their reply much that cannot be classified as accurate to say the least and it is on these remarks (or a few of them—we cannot spare all that much time!) that we feel compelled to now reply.

Paragraphs one and two of their letter, although outlining some of the activities of the F.B.A.S., seem rather irrelevant to the question under discussion. Of the wording contained in the third paragraph, and we quote "... If they can be encouraged (marine furnished aquaria), and our system can do this"—who do they think they are kidding? Their system was first in operation "four years before I.M.S.S. came into being"—yet marine showing has only become popular in the last two, and that thanks, in the main, to members of the I.M.S.S. who took the initial plunge. As for seeing marine furnished classes on their own—we suggest they open their eyes.

We did, indeed, approach the F.B.A.S. with a view to getting together on marine standards—and after waiting weeks for a reply, two of our members attended. ONLY two—yes. We thought the P.R.O. and Director representation enough—had we known that numbers were going to be an important factor we could have made it 102!

The last paragraph of their letter is unfortunately a complete misrepresentation of what transpired. (a) We do not think and never have thought the F.B.A.S. well versed enough to 'recommend' marine judges, so why on earth would we suggest it? (b) Even had we done so, it is the F.B.A.S. judges, if anybody, who have had little (or NO) practical experience—our judges only keep them! (marines, that is).

Not being content with replying in print to three simple questions that we asked, it now seems evident that the F.B.A.S. are taking reprisals against some of our members (who are also members of the F.B.A.S.) because we have in fact brought this to the attention of the aquatic public.

M. J. Parry (Public Relations Officer)
and
G. H. Jennings (Director),
International Marine Study Society,
Hampstead, London, N.W.6.

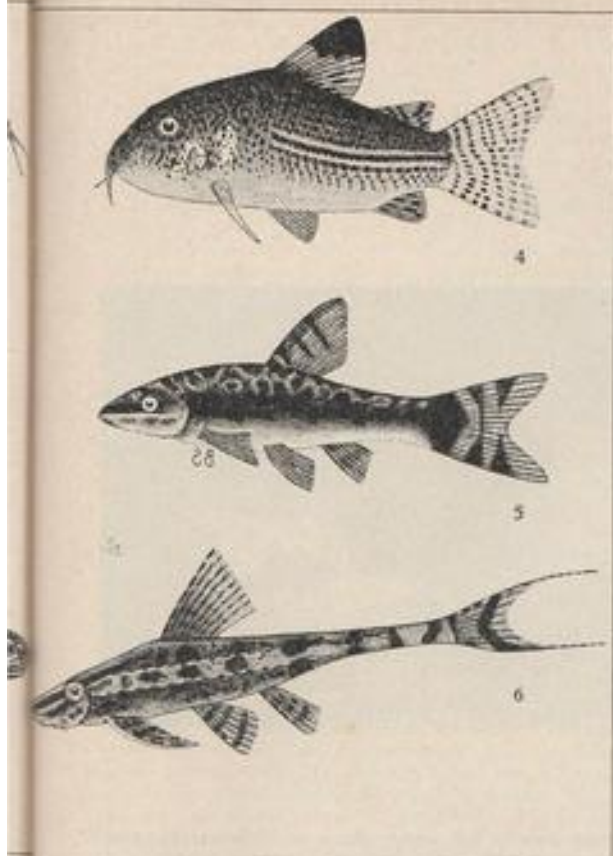
Omission Regretted

Although very gratified to see my article in this month's "The Aquarist", I was disappointed to see that you'd not given me credit as its author.

J. Welchman,
Valerie Court, Bath Road,
Reading (Berks).

Editor's Note:

My sincere apologies to Mr. Welchman to whom credit is now given in respect of "Holiday Arrangements" featured in the July issue.



1. *Leiocassis siamensis*
2. *Corydoras arcuatus*
3. *Plecostomus commersoni*
4. *Panetatus julli*
5. *Otocinclus vittatus*
6. *Loricaria parva*

THE JUNIOR AQUARIST

The fascination of pond life

by Cartwright Timms

FEW HOBBIES HOLD such attractions for its devotees as the study of pond life. On summer days the student may wander abroad, by the leafy wayside pool, the derelict canal and by the silent waters of wide lakes. On wet days and during the winter there is endless interesting occupation in the comfort of the home. Pond life study stirs the instincts of the hunter, arouses the curious interest of the scientist and preserves the sense of wonder that is one of the joys of childhood.

It is a hobby that costs little. You can travel to your hunting ground by car, train, bicycle or on foot. In any event you will not have to travel far, for everyone lives near water, if it is only a lake in a public park. It can be pursued at any hour of the day, any time of the year and at any age from eight to eighty.

One of the great fascinations of this pursuit is its uncertainty. When you stand beside a wayside pool which is almost covered with duckweed, you cannot tell what the dip of the net will reveal. It may be a host of common things, it may be a single rarity. You may be sure that it will be something, for every dip will bring to the surface some of the curious creatures that live in the depths.

Now about equipment. Your first need will be a net and I strongly advise you to make this yourself. The ring of the net should be three-eighths of an inch diameter and made of brass or stainless steel, bent to give a circle of



about four to five inches diameter. The net bag itself should have about twenty meshes to the inch. This will trap your captives, yet allow the surplus water to run through quickly. It is a good idea to reinforce the net at the point where the ring is inserted with a strip of calico or even thin leather. This is the place that gets the wear and tear, and a little forethought will greatly increase the life of your net.

Always carry a spare net bag in your haversack. Nothing is more disappointing than to arrive at your hunting ground on a bright day, and when you make your first dip, find that your net has fouled a concealed piece of metal that has torn the bag from end to end. A full day's collecting can be ruined. The net bag should not be more than six inches deep and the net handle not be more than four feet long.

All right then. You have arrived at your pond, it is a perfect day. Most of the pond is covered with duckweed, but there is a clear patch through which you can see a green jungle of pond weeds. Put the net slowly in the water, edge first, so that the net is at right angles to the surface of the pond, until the rim touches the sandy floor. Gently draw the net through the weeds, along under the duckweed, then to the edge of the pool, carefully scraping the sides. Then bring your net to the surface and let the water run out.

You will be left with a net half full of weeds, mud and various creepy-crawlies. Now you need a small white enamel pie dish, with an inch of water at the bottom. Turn the contents of the net into this dish and in a minute or so you will see what you have captured.

Remember that life in the pond is "red in tooth and claw." Many—probably most—of the dwellers in the pond are predators, so the first task is to separate the carnivores from the vegetarians. Your catch must be sorted out without delay, otherwise you will arrive home with one triumphant victor and the mangled remains of the rest of your catch. It is not necessary to take your captures home in water. They will travel quite safely in a small tin box loosely packed with damp pondweed. The angler's bait tin with its perforated top is ideal for transporting these pond creatures, but the tins used for throat pastilles are just as good, providing a few holes are made with a small nail.

When you reach home turn your captures out into shallow dishes. Photographic developing dishes, pie dishes, anything that will hold an inch or so of water will serve admirably. Now you can look them over before they go into their permanent homes.

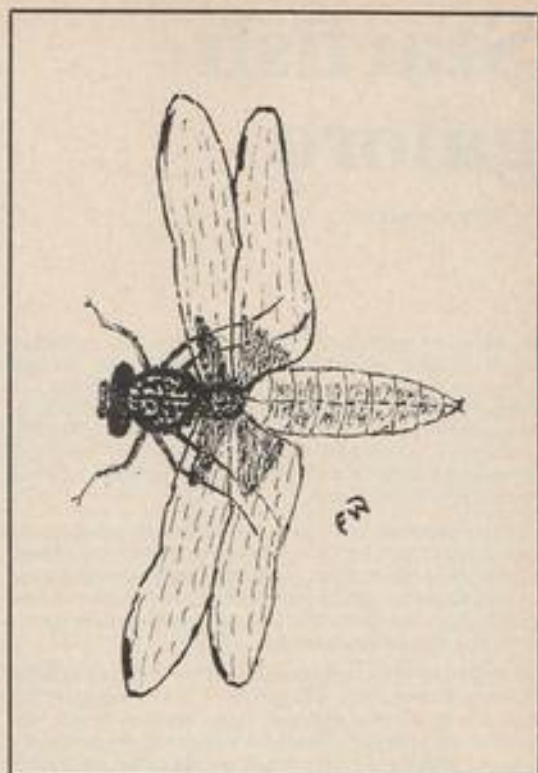
There is a great temptation to turn all your catch into one large aquarium so that you may feast your eyes on a lively concourse of water beetles, pond skaters, caddis grubs, dragonfly larvae and so on. This temptation should be resisted, otherwise by the end of the day your aquarium will be empty save for one victorious Dytiscus beetle. No, keep each species in a special container and avoid the horrors of total war.

Glass jam jars make excellent containers for these new additions and for years I used nothing else. An inch or so of sand is placed at the bottom and in this some of the pond weed may be planted. Add water to about two-thirds of the way up. The big objection to jam jars is that the glass often distorts, making observation difficult. Now I use the clear plastic containers that may be obtained in a variety of sizes from almost any store. It should be remembered that many of these aquatic insects can fly well, so a gauze cover should be tied over the mouth of the container.

There is endless interest in studying the inhabitants of the pond, but if you possess a microscope you will have a passport to a new world of enchantment. A bottle of water from your nearest pond or ditch will be found to be teeming with life, which will multiply with great rapidity. You will see many species of rotifers, tiny animals that appear to travel on ever-turning wheels, the vorticellae, like bells at the end of contracting stalks, other creatures that glide through the mud looking like prehistoric monsters.

As you proceed with your work, you will naturally devise special gadgets to help you. For instance, you will need some form of dredge to enable you to study the life at the bottom of large lakes. If you bring home creatures from fast-moving streams, you will have to find ways of substituting running water. There will be plenty of scope for your inventive genius.

Two last words of advice: never keep your captives where the direct rays of the sun will fall on them. This will bring about their speedy deaths. And never go pond-hunting in your best clothes. It is not a drawing-room occupation.



The Broad-bodied Libellula Dragon-fly

THIS IS ONE OF THE SPECIES known as "Darter" Dragon-flies, because their habit is to dart to and fro in search of their prey rather than make the long flights of the "Hawker" Dragon-flies.

The Broad-bodied Libellula is about 1½ inches long and its abdomen can be nearly ½ inch wide, the widest of any species. The adult male is unmistakable as the abdomen is powder-blue, whilst that of the female is tawny-brown. It is on the wing from about mid-May to mid-August and is common in southern England.

Another name for *Libellula depressa* is "Horse Stinger" which name used to be given by some country-folk to all species of Dragon-fly. As all are completely harmless except as regards other insects, a possible explanation of the name is that Dragon-flies sometimes dart at the flies which often surround horses out in the fields, so giving the impression that they are attacking the horses. Also *Libellula depressa*, with its short, broad abdomen, has a shape rather similar to that of a bee or wasp.

This Dragon-fly is often seen flying over marshes and it will sometimes breed in brackish water. The nymph (or immature form) is short-bodied, a mottled brown in colour and hairy: it is about 1 inch long from its head to the end of its tail appendages, and lives in the mud at the bottom of ditches, ponds and lakes.

The Broad-bodied Libellula is found over practically the whole of Europe, and in Asia Minor and Syria.

Starfish galore

by Terry Jennings

IN SPITE OF TORREY CANYON and other less publicised efforts to pour oil on to troubled waters, there are still countless millions of starfish around our coasts. In places the beaches are littered with them. True some of these starfish have lost their red, purple or orange colouring, as a result of prolonged exposure to the sun and wind, and are in an advanced state of *rigor mortis*, but many near the water's edge are still alive.

The way to tell is to turn the starfish over and, if the animal is not moribund, the hundreds of tiny protuberances, arranged in pairs on either side of the groove running along each of the arms, will be waving slowly to and fro. These are the feet, each one a hollow tube operated by an ingenious hydraulic mechanism.

On the starfish's back, near its centre, there is a circular structure known as the madreporite or sieve, through which the animal absorbs seawater. Via intricate canals, the water courses through the starfish's body and, by means of a series of valves and reservoirs, is carried to the extremities of the radial arms by way of the feet. These feet are elastic and each terminates in a little sucking pad. As each water-filled foot is pressed against the sea-bed, the starfish rhythmically draws the water out from it again, and

thus creates a tiny suction tube.

Alternatively fastening the tube feet and withdrawing them, making use of every pebble and seaweed stem to which it can adhere, the starfish creeps along through the water. It cannot see where it is going. There is a tiny crimson eyespot at the tip of each arm, but these inform the starfish of no more than light and darkness.

As a method of locomotion the tube feet are adequate, provided there is no urgency, for even a starfish in a tearing hurry takes nearly twenty minutes to travel a single yard. As feeding appliances the tube feet are unsurpassed, being able to lever open shellfish, on which starfish feed, to reach the meat inside.

Using its suckers, a hungry starfish seizes a helpless mollusc and proceeds to erect itself upon the tips of its long arms, converting its body into a sort of tent or cage around the victim. With its tube feet the starfish pulls at the two valves of the shell, a pull of as much as three pounds. For a long time nothing happens, because the adductor muscles closing the valves are much more powerful than the starfish muscles. But the starfish is able to use its numerous tube feet in relays, so that eventually, after perhaps an hour or two, the shellfish weakens and its



Common sunstar
(*Solaster papposus*)



North Sea brittle star (*Ophiothrix fragilis*)



Common starfish

valves gape open. To pull a limpet off a rock requires a direct force of thirty pounds or more; yet incredible though it may seem, the flabby-looking starfish is also capable of doing just that.

On the underside of the starfish's body is its tiny mouth, far too small to admit many of these creatures that form the main part of its diet. This difficulty is overcome quite simply: the starfish thrusts out its stomach through its mouth and pours digestive juices on to its prey. In a surprisingly short space of time the soft, juicy meat is digested and absorbed, and the empty shell is cast away.

Travelling in hordes, starfish will demolish an oyster-bed in a single night. At one time oyster fishermen, infuriated by the ravages caused by starfish, used to pull to pieces any which came up with the dredge before throwing them back. Unfortunately for the fishermen, they did not know that even a single starfish arm, if attached to at least half of the central disc, may quite quickly grow the missing parts. This remarkable power of regeneration is of the utmost survival value as a means of eluding a predator or escaping from under stones rolled by the waves, for the animal is able to amputate its own arms at will. There may be more to it than this for a starfish will also shed its limbs in

unfamiliar circumstances, including when it is placed in an aquarium if this is not done carefully.

Starfish should be kept in a tank that contains fairly coarse gravel to which the tube feet of the animals can adhere. The container in which they were transported from the bench should be floated in the tank and a few drops of the aquarium water added until eventually, after several hours, the container sinks and the starfish are liberated. In this way the animals are not subjected to sudden changes of temperature or salinity. Once the starfish are free they should be gently held against the side of the tank so that they can begin life in their new environment with a firm foothold. Mussels are a good food for captive starfish and about the same number of mussels as starfish will be required. Small pieces of raw fish are also eaten.

With luck the last great rite in a starfish's life can be observed when, if female, it pours out a filmy exudate of eggs or, if male, floods the water with a cloudy jet of sperm cells. Some of these male and female sex cells blend to produce thousands of minute ciliated larvae which only gradually, by a very strange form of metamorphosis, become converted into adult starfish.



Brittle star (*Ophiura albida*)

The electric catfish

Malaptererus electricus

by T. Hinitt

THIS VERY UNUSUAL and interesting inhabitant of West African rivers makes an attractive showpiece for the aquarist who prefers something a little out of the ordinary. In the wild state the Electric Catfish can be found in most of the slower-moving rivers of West Africa, lying by day under some rotting tree stump or other suitable hiding place and only becoming active at night when the search for food takes place. Primarily this catfish feeds on other fish, of appropriate size, which it first stuns with a powerful electric shock. This shock has been measured at 80 volts for a 6 in. specimen. As the electric catfish can grow to some 2 ft. a shock of some 400 volts could be expected of a fish this size. Though not as powerful a shock as that of the Electric Eel it would, nevertheless, give a human being a nasty jolt. Before you hastily turn the page let me add that this fish rarely exceeds 10 in. in the home aquarium.

As to the appearance of this catfish; it certainly cannot be called pretty. However, the unusual nature of the creature more than makes up for its unprepossessing appearance. In shape it is very much like a large pork sausage with a plentiful array of fleshy barbels and two tiny eyes at one end with a strong rounded tail at the other. The body has no scales at all but is covered with a very attractive layer of skin. This skin is usually of a purplish brown colour liberally covered with large black blotches. When young there is also a white band surrounding the caudal peduncle; as the fish ages this area gradually darkens. The underside is usually of a grey colour but this will probably vary depending on the fish's habitat. Fintage is rather sparse, but what there is can certainly be called beautiful. The tail, for instance, is alternately banded with brown and cream and usually sports a red border. Likewise the anal fin is of similar colouring. The dorsal fin is reduced to a fleshy appendage just in front of the tail.

My Electric Catfish was purchased just over a year ago and was then a modest six inches long. Over the past year he has extended himself some 4 in. and, I hope, has now stopped growing. Originally there were two of the beasts as I had ordered a pair thinking that they would be happier for a little company. However, I was proved wrong as the smaller of the two was so badly mauled that he had to be destroyed. A couple might live happily together if the aquarium was divided by a glass partition but I believe that they would still attempt to shock each other through the glass. Better by far to purchase the one specimen and give him a 36 in. tank to himself. Like most catfish they prefer a dimly lit tank with plenty of hiding places. I use pieces of

waterlogged wood. This both looks very decorative and provides an excellent hiding place. The bottom should be covered with ordinary aquarium gravel as these fish like to excavate a hollow in which to lie. I think that plants are best left out of any aquarium containing large catfish as they are certain to be uprooted sooner or later (usually sooner). One plant which can be used with great effect is the Water Lettuce (*Pistia stratiotes*). This will float on the surface of the water and provide shade from the electric lighting.

The Electric Catfish is not particular about the water in which he lives. For preference, however, it should not be too fresh. By this I mean not straight from the tap as pure tap water will cause it to breathe rather rapidly although this does not appear to do them any harm. A filter is not a necessity in the tank though it is definitely an advantage and helps to keep the aquarium clean. My tank has been unfiltered for a year and it is still as fresh and clean as the day it was set up. This state of affairs no doubt will not last indefinitely.

The feeding of these creatures is perhaps the easiest task to fulfil as they show an extreme liking for the common or garden earthworm. Two good-size worms a day appears to satisfy the appetite of my specimen. These may be fed whole as the catfish's mouth is of large capacity. Another delicacy which can be fed when obtainable is chopped prawn. This can also be fed in large lumps.

Should this passage inspire you to purchase an Electric Cat I will add that your specimen will have to be specially ordered as very few shops have them in stock but once obtained you will very definitely have a fish to be proud of.

LI-LO FISH AQUARIUM

A recent new edition to the Li-Lo Pet equipment range is the Li-Lo Fish Aquarium complete with base and lid.

With a 2-gal. capacity, it has a transparent polystyrene body and is, of course, rust-resistant. The lid and base in ivory are made from impact styrene. A length of non-toxic plastic tubing is supplied for use in the syphoning of water when the tank needs to be emptied.

It has a recommended retail selling price of 22s. 9d.



THE AQUARIST

Book Review

The World of Reptiles. By Brian Vesey-Fitzgerald (Pelham Books, 25/-).

REPTILES receive a poor press. Either from the misdeeds of Eve with some scaly visitor to the Garden of Eden, or the swift-moving snake's threat of death in every fictional explorer, they merit a better public image. Though not the first book of this title, this work follows the author's recent little book on fishes in the same series with a well-informed summary of structure and habit which should help new pet-keepers, teachers and amateur naturalists who see a jewel in the lively lizard's eye and do not despise the serpent.

The book merits few criticisms, though sharks preceded lizards with internal fertilisation (p. 69) and the American alligator can do better in age-records with 73 authentic years. The grass-snake is not "wholly absent from the county of Lancashire" (p. 118) for, apart from escaped Spanish pets in the south, it is still a wild native in the Grizedale Forest area of the northern fells, where a 2 ft. 6 in. specimen was found at Frith in 1964. Ainsdale dunes in Lancashire should also be added to the sand-lizard's major haunts, as it is probably more numerous there than on the southern heaths quoted. Though scarcer since the 1962-63 frosts, the frog definitely survives in Lancashire, despite the author's doubts, and it is far from "a very rare animal there."

The book deals with classification, locomotion, sex and reproduction, growth, feeding and fighting. The final chapter on Man and Reptiles is rather routine and makes no reference, for instance, to Cairo's interesting use of snake-charmers to lure these often useful snakes from retreats in the rambling old houses, snake-catchers who often maintain their trade, like old English rabbit-warreners, by secretly restocking, a subject with which "Flucker" the well-known angling correspondent of the old *Egyptian Gazette* entertained our wartime visits with his little illustrated book on the subject, published in Cairo.

The index is rather slight, omitting several subjects in the text, like chameleon and skink, and the illustrations, in black and white, vary in their originality.—ERIC HARDY.

Find the fish

by Doreen Thiel

The first is in CROWD but not in ALONE
The second is in VOLUME and also in TONE
The third is in MODEL but not in TOY
The fourth is in GIRL but not found in BOY
The fifth is in STOOL but not in CHAIR
The sixth is in APPLE as well as in PEAR
The seventh is in INCH but is not in FOOT
The eighth is in SHOT but not found in PUTT
The ninth is in SQUARE and also in ROUND
The tenth is in OUNCE and also in POUND
The last is in LEADER of the "twenty-six".

Solution on page 541

September, 1968

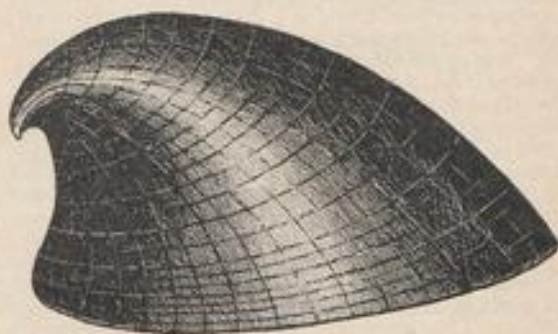
Waterlife pests and friends

by Bill Simms

BOTH of our freshwater limpets, *Ancylastrum fluviatile* and *Ancylus lacustris*, are quite small, reaching a length of just over $\frac{1}{2}$ in., but they are so generally distributed that most aquarists will notice them at some time.

The one shown here, *A. fluviatile*, is normally found sticking to stones below water level, for it never comes to the surface. It breathes by diffusion through its skin and has therefore lost its lung cavity.

Because of its well-streamlined shape this limpet can exist in very fast-running water, though it is often found in ponds and lakes, also. However, it is commonly known as the River Limpet; whereas the other, which clings to vegetation (such as the underside of water lily leaves), remains mainly in still waters and is called the Lake Limpet. Its flatter shell appears to suit its habit of slowly crawling about on reeds, and similar crowded vegetation areas. Very small items form the diet of the creatures for they browse on blue-green algae and on the diatoms present nearly everywhere in water. They can do little harm in an aquarium but unless they were in quantity would be of little help in clearing a bad infestation of blue-green algae.



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Our experts' answers to your queries

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

Coldwater queries answered by A. Boarder

I am setting up a tank for coldwater fishes, which is 36 x 15 x 15 in., and would like to know how many fish to stock it with and what kinds? I would like a good variety.

Your tank will hold about 22 inches of fish. In your estimate do not reckon the tail. It is always easier to keep a smaller number of fish than the rule given, as not only will it be better for the fish but it will allow for growth. As to the kinds to keep this is to a great extent an individual choice, but I will suggest some suitable kinds for you to look at. Among the easier and colourful types are the common goldfish, the fantail, shubunkin, comet, moor, veiltail, oranda and lionhead. The fish with flowing finnage such as the veiltail and oranda are not as easy as the others to keep in a mixed tank. You could have a couple of small tench, either green or golden, and golden rudd are also attractive. It is essential that the fish are small specimens as these always thrive better than larger ones, the latter being more inclined to be upset by the change from conditions which they have known for a long time. Small golden orfe are very good but as they can grow very quickly they must be watched and removed to an outside pond if they get too big. They also like a very well oxygenated water or they soon die.

If I make a pond with concrete slabs will they be harmful to fish and will they crack in winter?

Concrete slabs will not be harmful to the fish and they will not crack when the pond freezes over. However, your trouble may come with the material you use for joining up the slabs. This should be a very strong mixture of three parts sharp, clean sand to one part fresh cement. The edges of the slabs must be wetted so that the concrete will adhere to it well. If any cracking takes place when the pond freezes over it will be at these joints and so the importance of making them very strong will be realised.

You have stated often that more fish are killed by over-feeding than by any other means. I take it that it is uneaten food which causes the trouble?

This is quite correct as fishes do not over-eat. Most of the fishes which are kept in tanks have very small stomachs, unlike the perch and pike, and can only take a limited amount of food at a time. It is the food which remains uneaten which causes the pollution in a tank and so turns the water foul. In consequence of this the fishes go off their food and so things go from bad to worse. Once the oxygen content of the water falls below a certain level the fish are unable to digest their food properly and cease feeding altogether. The fish will not be killed by over-feeding, that is as long as they can clear up the food before it starts to go bad. Little and often is the way to grow fishes quickly, as long as all food given is cleared up within a few minutes.

Our garden pond was made with Plastoline and appears to be doing well with the fish thriving and the plants growing. However, there is a film of oil-like substance on top of the water. What is causing this? Could it be from a water pump which is in the pond?

It is possible that some of the oil is from the pump, but there should not be enough to cover the surface of the pond. It is more likely that the trouble is caused by the decaying of vegetation in the pond. If you have a water lily it is probable that some decaying leaves have caused the oil-like substance to form. If one inspects a decaying water lily leaf one will find that if it is pushed below the surface, there will be a patch of oil-like matter come from it. I know of little which can pollute the water more quickly than a quantity of decaying lily leaves or flowers. The pond may require cleaning out and refilling before you can get rid of the film of oil.

I have made a pool, 16 x 8 x 21 feet, and wish to stock it with fish but wish to keep it below the maximum stocking so that the fishes can grow and thrive. I have two 6 in. higo, six 5 in. goldfish at present and would like to know how many golden orfe I can add and how large. I would like the fish to be able to grow to a maximum size?

Your pond could safely hold six well-grown orfe. You could start with a dozen four-inch orfe and when they have grown on you could remove half of them. However if you do not wish to interfere with them at any time I suggest that you have six four-inch orfe only. These will soon grow if fed well. Orfe are a splendid fish for the

larger pond and if fed with plenty of varied foods including plenty of live foods they will soon grow. A four-inch fish can get to a foot long in four years if well fed with plenty of swimming space.

I have a glass fibre pool which is 5x3x1 feet. I also have a water lily and other water plants. I have a few goldfish and the sun gets to the pool most of the time. My trouble is that the water is very green. How can I clear it up?

The pool is small and so requires more care to keep in good condition than would a larger one. The sun encourages the growth of green Algae which is the cause of the cloudy water. It is not easy to clear this by changing the water but once the water plants grow they will choke out much of the Algae. Meanwhile stop all artificial feeding of the fish and you may find that the water will become clearer. It is surprising how much matter can be cleared up by hungry goldfish.

Two of my goldfish have spawned in my pond. I gathered up the eggs and put them in a bucket to hatch. How long do they take to hatch and what must I do when they do hatch?

Goldfish eggs hatch from about four days when the water temperature is about 70°F. At a lower temperature they take longer, but usually hatch at a week if the weather has not been very cold. I do not encourage the use of a bucket as a hatching tank. It is too deep and a plastic washing-up bowl as can be bought at most stores is much better, being shallow it not only keeps oxygenating the water better but also enables the fry to reach the surface more easily than in a deeper receptacle.

I have a 6 in. bubble-eye goldfish which has fin congestion badly. What can I do to cure it?

Several types of goldfish with rather flowing fins are liable to get this trouble. It is sometimes caused by a chill but can be caused by bad conditions in the tank. The first thing to do will be to clean out the tank. The fish can be cured by giving it a salt bath in slightly warmer water than that in which it has lived. Use a shallow container and add sea salt at the rate of a tablespoonful to a gallon of water. Do not stir the solution but allow the salt to gradually dissolve. Do not use table salt but sea salt such as Tidman's is much better. After about a week the condition should clear up and the water can then be gradually weakened in strength by adding fresh water or changing it.

I have been advised to place six freshwater mussels in my pond. It is a plastic one with about two inches of mud at the bottom. The pool is about sixty square feet and 20 in. deep.

I do not see much use in adding the mussels. As you have some mud at the bottom it is possible for the mussels to live, but they would never do so if they had no mud or mulm in which to move about. You may hardly ever see them again once you put them in the pond and so their use will be very limited. A few mussels never kept a pond clean, the idea that they would is wishful thinking.

Why is it that one of my two ponds is very murky and green whilst the other is quite clear?

This is one of those things which can puzzle anyone. I have known the same thing to happen with varying tanks. Almost the same conditions will not always produce the same results and it is often difficult to pin down the actual reason for the difference. It may be that one pond has had some extra dried food given at some time and this can very quickly change the whole condition of the water. It may be necessary to clean out the murky pond and make a fresh start. Go easy with the feeding and all may be well.

Tropical queries answered

I have been told that the presence of *Limnaea* snails in a tropical tank will lead to all sorts of ailments among the fish. Is this correct?

We have never experienced any trouble ourselves, but Professor Gunther Sterba, in his excellent *Aquarium Care*, does state that the so-called wandering snail (*L. ovata peregra*) exudes a substance which may have a bad effect on the health of fishes.

Is it true that Australian four-leaved clover (*Marsilea*) grows in the natural state in Europe?

Species of *Marsilea* occur in many parts of the temperate and tropical world. A score or more of species are native to Australia. The best known (to tropical aquarists) are *M. drummondii*, and *M. hirsuta*. So far as we know these have not been naturalized in Europe. There are only a few species indigenous to Europe. The one known to aquarists is *M. quadrifolia*.

How does the mud-skipper manage to survive out of the water for minutes, perhaps hours, on end?

To the best of our knowledge the mud-skipper draws on the supply of oxygen stored in the large gill-chambers. It is also said that oxygen in the water is absorbed through the tail, which is often dangled in the water. At all times, however, the fish must keep its body moist. If the contacting atmosphere is not moist enough the fish returns to the water, or rolls over in puddles, at frequent intervals.

How does one sex the coldwater panchax (*Oryzias latipes*)?

In well-grown fish the sexes may be distinguished by the fact that the anal fin of the male is noticeably larger than that of the female. Also, the posterior part of his dorsal fin has a v-shaped nick in it, just as though a piece has been snipped out.

Our local dealer has some barbs which he says are *B. chola*. I cannot see any difference between these fish and my rosy barbs. Please tell me how the two species may be told apart and whether *B. chola* is an easy fish to keep and breed.

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tropical queries

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The fish in your dealer's tank must be young specimens; for *B.ichola* in its larger sizes is a more colourful fish than *B.zebronia*—it flashes splendid greeny gold lights off the gill-covers—and it also has a pair of small barbels. It breeds freely and is easy to feed. With plenty of swimming space it grows slightly larger than the rosy barb.

What is the scientific name of a cichlid called the demon fish?

The demon fish is *Geophagus jurupari*. Which brings to mind the interesting fact that this attractive-looking species is neither demon-like in appearance nor wickedly mischievous in its behaviour. For all that, *G. jurupari* is best kept out of a community tank, except a large one stocked with large fishes, when it approaches full size (8 to 9 in.).

I should appreciate some information on the breeding procedure of the climbing perch (*Anabas testudineus*).

A. testudineus differs from most of the anabantids in that it does not blow a bubble nest for the reception of its eggs. After some chasing about, the female extrudes hundreds of eggs which float at the surface. The parents take no notice of them. The fry break free in about two days and then need plenty of the usual small live food.

I have been told that the albino paradise fish is peaceful enough to share quarters with other fishes of about its own size. May I have the benefit of your experience?

The albino paradise fish is not nearly so quarrelsome as the ordinary paradise fish (*Macropodus opercularis*), and *M. opercularis* itself is on the way to becoming respectable; for long domestication—it is just about a hundred years since this species was first bred in an aquarium in France—has reduced its former fire. We would say that the albino variety, developed in Germany some thirty-five years ago, is quite suitable for a community tank occupied by sturdy tetras, barbs, tooth-carps, and the like.

Is it true that gambusias are seldom attacked by disease?

At least one well-known writer on aquarium fishes has recorded that *Gambusia affinis* is resistant to disease. But then any fish that will stand a temperature down to the fifties (°F), and does not succumb of a hurry to any overcrowding is not likely to fall prey to a disease triggered off by bad conditions. And *G. affinis* is such a fish.

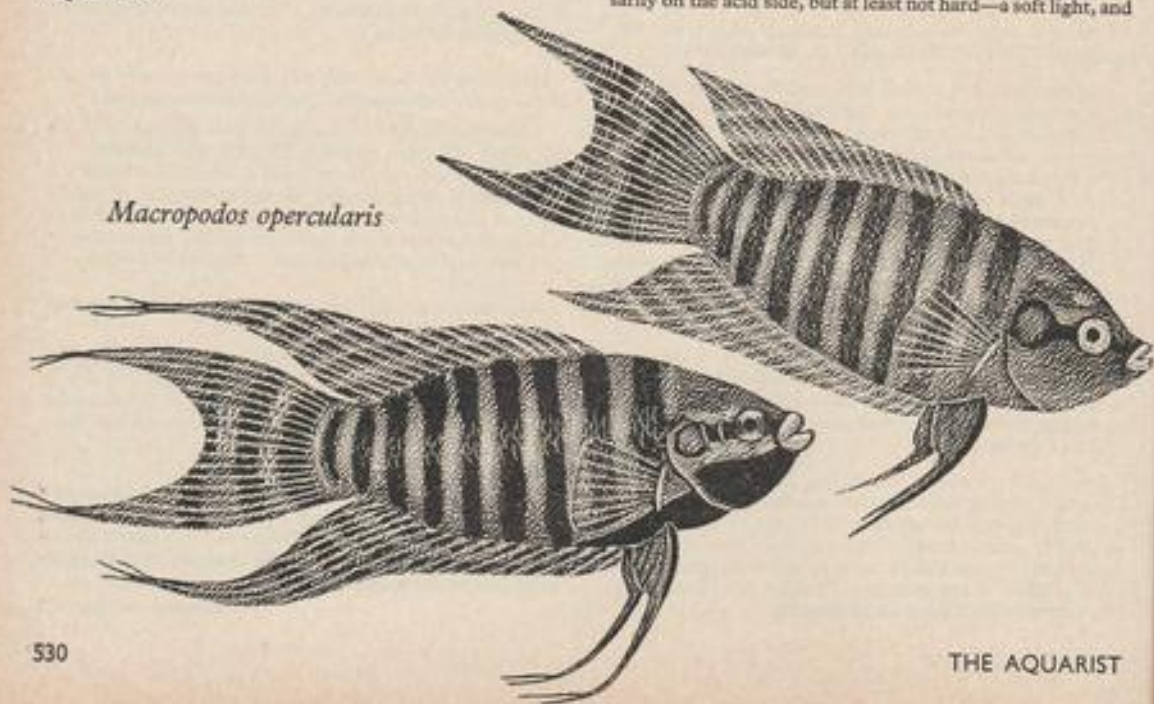
On a day trip into the country I came across a pond in which I found what I believe to be a species of chara, that is to say a plant like a smaller edition of hornwort, but with very brittle and very tangled whitish green stems and foliage. Would this plant take to life in a tropical aquarium?

Some of the charas settle down quite well in a tropical aquarium provided the change from pond temperatures to tropical aquarium temperatures is brought about gradually.

What sort of set up and care is needed to bring off a successful spawning of *Pelmatachromis amnectus*?

The basic requirements are matured water—not necessarily on the acid side, but at least not hard—a soft light, and

Macropodus opercularis



a place into which the couple may retire, such as an overturned flower pot or a cave made of slabs of non-calcareous stone. A temperature of about 78°F (26°C) is advised. Plenty of strong-rooting plants help to provide the right sort of environment for courting fish and their fry. The fry are free from the eggs in about three days. They need brine shrimps, or, say, tiny *Daphnia* until they are large enough to be got on to larger food.

Is the flying fox suitable for a community tank?

There are two things to bear in mind before you buy a pair or two of *Epalzeorhynchus kallopterus*. One is that it grows to a length of about 4 in. Next, it dashes about wildly at times and can scare the wits out of much smaller or timid companions. Otherwise it is a showy and non-pugnacious species, and easy to keep.

Please tell me the scientific name and general requirements of a fish called the Chinese sucking loach.

This fish is neither a loach nor a native of China. It belongs to the family *Gyrinocheilidae*, which is confined to a limited area of south-east Asia—Thailand and thereabouts—and is formally known as *Gyrinocheilus aymonieri*. It appears to live on algae almost exclusively, and will live quite contentedly in a well-aerated aquarium maintained at a temperature range of from 72°F (22°C) to 82°F (27°C).

Is the black widow fish difficult to breed?

The black widow fish (*Gymnocorymbus ternetzi*) is not particularly difficult to breed—in fact, not a few tropical aquarists have found it quite easy. It is important, however, to separate the parent fish from the eggs, which they do not hesitate to eat, as quickly as possible. The eggs hatch in about 36 hours and the fry grow rapidly on infusoria, green water, and the usual larger-than-infusoria live-foods. The spawning tank should be provided with a tangle of fine-foliaged plants and soft, neutral to acid water. A temperature of about 78°F (25°C) is called for.

Is a glass cover really necessary on a tropical aquarium? I should like my electric lamps to be as near to the water as possible.

A glass cover is not really necessary (except for an aquarium stocked with fishes known to jump) but everything points in its favour; for bear in mind that a cover glass, or a well-fitting hood made of some non-toxic material, lessens evaporation, keeps out a lot of atmospheric impurities, and, very important this, guards against water getting into the electric fittings. You did not tell us what sort of lighting system you are using, or intend to use. We mention this because if fluorescent lighting is installed, the tube may be positioned close up to the glass without any danger of cracks developing.

I have just bought two small catfish called *Myxus vittatus*. Will these fish do any damage in a community tank?

If you mean to the furnishings the short answer is no. But we must point out that when this catfish attains a length of about 4 in. it is not to be trusted with much smaller fishes.

What size tank do you suggest for spawning a pair of *Tilapia mossambica*?

It all depends on the size of your fish, which become sexually mature at about 4 in. Generally speaking, a half-grown pair need a tank measuring about 3 to 4 ft. long.

I should like to keep some of the cichlids other than angel fish or discus or the dwarfs, but a more experienced aquarist friend has told me that cichlids will eat the plants, and a tank without plants is not my idea of a decorative aquarium. Your comments would be appreciated.

Not all cichlids are plant destroyers, except when breeding, and even then they do not make a practice of destroying them. What they usually do is to pull them up in order to make pits to incubate the eggs, or house the fry until they are ready to lead a separate existence. We believe you would find the firemouth cichlid (*Cichlasoma meeki*), *C. severum*, and the acaras called *Aequidens maroni* and *A. latifrons* well worth a trial.

Why do writers on aquarium fishes, even writers known to have kept fishes over several decades, make contradictory statements with regard to the number of fishes that may be kept in a tank of a given size without artificial aeration?

Reliable writers do not make contradictory statements on this subject, but they cannot possibly lay down strict rules; for commonsense on the part of the aquarist must play its part too. For instance, small slim fishes take less oxygen (usually) from the water than small but heavily built fishes. Also, fishes that live in the wild in cool running water like, say, White Cloud Mountain minnows, need more space in well-aerated water than fishes from really warm stagnant pools.

My aquarium has been in use over the last twelve years and rust has eaten into the top angle bars. On occasions small fragments of the frame break away and fall into the water. It is not unlikely that some of these tiny pieces of rusty metal escape my notice and get lost in the compost. Will this lead to poisoning of the fish?

A very small quantity of rusty iron in the water appears to have no harmful effects on fish. At least this has been our experience in a lifetime of fishkeeping.

Is it a fact that paradise fish (*Macropodus opercularis*) will live all the year round in a room kept comfortably warm without any additional heat?

It is quite true. But when you buy your paradise fish you will have to keep them for a time at the temperature of the tank from which they were taken. Then, to be on the safe side, do not lower the temperature to room temperature too rapidly. In a word, bring about the change over a period of a week to a fortnight.

I bought a pair of two-spot gouramis—the dealer assured me they would not molest my other fishes—but soon after I placed them in my community tank,

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Aquatic acrobats

a visit to the dolphin pool at the aquarium

THE DOLPHIN POOL at Brighton Aquarium will almost certainly rate as one of the major attractions at the popular south coast resort and the proof of it was there on my visit to the Aquarium. The first impression was of sound—happy sound—as the scores of children grouped around the pool squealed and chattered with delight at the antics of the two dolphins as their trainer, Mr. Jerry Mitchell, took them through a training course.

The sleek blue-grey shapes swept up from the depths of the 12 feet deep water to leap over a rope stretched high above the pool, with a grace that no high-jumper could attempt; still higher they leapt as Jerry held a fish clipped to a pole and the dolphins hurled themselves high in the air, just missing the target morsel again and again before a supreme effort brought reward; at the trainer's signal to acknowledge the applause, the dolphins cruised around the arena, breaking water in a graceful "bow" to each segment of the audience; then a pause at the trainer's platform for their reward, a piece of fish and a tickle under the chin, sometimes taken standing on their tails as they reared up almost out of the water.

Hard to believe that only a few weeks before the aquatic acrobats had been swimming around the Gulf of Mexico, and that the performance we were witnessing came after only 3½ weeks of training. But then, dolphins are astonishingly intelligent as the Aquarium director, Mr. Graham Cox, explained. To the obvious question of how in such a short time they had been trained to perform such difficult tricks, the answer lay in the exceptionally large brain-volume of the dolphins in relation to their size—a brain much larger in ratio than that of humans, giving them an extraordinary capacity for reasoning. They have an uncanny ability to relate cause and effect, and this is the basis of the training methods which must be carried out with regard for the dolphins' sensitivity. Any harsh or abusive treatment would ruin their behaviour; in fact, as Mr. Cox pointed out, the greatest unkindness that is ever shown to them at Brighton is for their trainer to turn his back and ignore them. They react violently, thrashing around the pool in an obvious state of distress until the "stern parent" relents and gives them his attention.

Training is basically a matter of rewarding a desired action. In the initial stages they are closely watched and when some action is done spontaneously, the trainer blows a whistle and offers a reward of fish. The dolphins quickly learn to associate the action with the reward and will repeat it. In the high-jump, for instance, the rope or bar is placed under water and when the dolphins swim over it and earn the whistle and the reward, the first stage has been passed. From there it is a matter of raising the rope by stages until it has reached the maximum height of their jump. The same reward system is used throughout their training and is capable of even more impressive and entertaining heights than we were watching. Jerry hails from the U.S.A. and was, until his arrival in Brighton, at the Marineland of Canada at Niagara Falls.

The entertainment is heightened by the almost comical air of the performers whose "expression" of cheerful impishness is maintained by the up-curved corners of the mouth, giving them the appearance of circus clowns. Their antic behaviour is a natural trait; I have watched dolphins from the bows of an inter-island ferry in New Zealand cavorting and capering almost dangerously close to the stem of the ship—in the tradition of the famous "Pelorous Jack," a dolphin which for years escorted the ships on their way and guided them through the reef-strewn waters of Pelorous Sound. At the fine marine aquarium at Coolangatta in Australia I saw the almost



human relationship between the dolphins and their trainer as he wrestled and raced with them, like a father letting off steam with his sons.

Whilst the pool at Brighton is more confined in area (a diameter of 40 ft., with a depth of 12 ft.) it has the great advantage of close-range vision and every movement of the dolphins can be watched in detail. With this goes the danger of spectators throwing food and litter into the pool with serious consequences to the health of exhibits on a very strict diet, but Mr. Cox reports that behaviour has been very good and the notices covering this hazard have been respected.

The pool, which cost some £25,000, is the initial and major part of an extensive scheme of development at the Brighton Aquarium under the direction of Mr. Cox. He visited America and Canada to study the techniques at several of the largest dolphin pools and has adapted these to the specialised requirements of the indoor installation.

at Brighton

A former ballroom has been extended to house the pool which is ideally situated near the entrance and has the advantage of ample natural light. A complex system of filtration has been installed and its maintenance is closely supervised since it has a highly critical function. The excretory deposit from the two dolphins amounts to some 14 lbs. every day and this together with other detritus must be cleared efficiently to protect the health of these precious exhibits valued at £2,000 each.

Nor is filtration the only special care of the aquarium staff: the feeding of the dolphins is a tricky business, and Mr. Cox showed me charts and graphs measuring the "balanced diet" and the resulting condition of his charges. The quality of the food is watched carefully, especially with fish, and is governed by strict rules and information on the danger-signs to look for when selecting fish for food. All containers and utensils, even down to the mixing spoons, are sterilised after every feed in a scrupulous programme of protection.

Pool temperature is important, too, and with a capacity of 50,000 galls. to control there is need for constant watchfulness if the condition and performance of the dolphins is not to suffer.

Dolphins are mammals and their habit of "porpoising" through the water arises from their need to breathe above water every thirty seconds. It is this that makes the task of catching them a tricky business for if the dolphin is caught in the net and is not brought to the surface in half a minute, it will drown. They are equipped with a remarkable ability to breathe in quickly at a vastly speedier intake than the human lung function; a natural development from their environment in the need to take swift evasive action from any above-water danger. The pair at Brighton, a male and female, are of the bottle-nosed variety (*Tursiops truncatus*) and will grow to some eight feet in length in their normal span of 18-20 years.

For Mr. Cox and his staff the dolphin pool is only one of many responsibilities, though I discerned a special regard for it because of its tremendous popularity with visitors—and also, no doubt, from the affection they feel towards this pair of comedians. One could become quickly and closely attached to these graceful giants with their enchanting "smile" and the ebullience of gambolling puppies.

Elsewhere in the Aquarium, as I have mentioned, improvements and alterations are progressing steadily towards the goal of making Brighton Aquarium the best of its kind. In one respect aquarists who read this can assist Mr. Cox in contributing specimens. There is a constant need for large specimens of tropicals, freshwater or marine, and any aquarist who may have these larger fish that have outgrown the home tank should get in touch with Mr. Cox, the Director of the Brighton Aquarium, who will pay well for acceptable specimens and arrange to collect them.

W.J.Y.

The Cherry barb

by Rod West

FOR THE ORDINARY aquarist with a community tank, a pair of Cherry Barbs (*Barbus titteya*) is a worthwhile addition. The Cherry Barb is a fair-sized fish which is not only very peaceable, but also very hardy and easy to keep.

"Titteya" is the native name for the fish, and its natural habitat is the inland waters of Ceylon. Cherry Barbs imported from these regions lack the intensity of coloration displayed by the "homegrown" variety, the fine condition of the latter probably being due to the good care lavished upon them by their "foster parents."



When not in breeding array, male and female are somewhat similar, both sexes having a light brown background colour, with a deeper rich brown line running the length of the body. Above this line can be discerned a pale golden stripe. The fins of both are of a brownish hue, turned reddish in the male where they may also be edged with black in some specimens.

However, when in breeding garb, any similarity ends abruptly. Then, the male flushes up to a deep ruby red, the central line disappears and he positively glows as he spreads his little, fan-shaped fins to splitting point while he circles round his intended mate.

For breeding purposes, the standard 24 in. by 8 in. by 8 in. tank will suffice. The use of pure rainwater is recommended, but I have been quite successful in using one third rainwater to two thirds tap water. The temperature of the water is best kept around 78°-80°F. (26°-27°C.).

The Cherry Barb likes to spawn in plant thickets so the best method is to cover the floor of the aquarium with small, well-washed plants, such as young Broad-leafed Indian Fern, gathered into clumps; with, perhaps, a number of *Ambulia* or *Cabomba* in the rear corners.

The pair intended for spawning should be placed in the tank about two hours before dusk, to enable them to become acquainted with each other. If all goes well, spawning should have been completed sometime the following morning, and the aquarist should be on the scene early to remove both parents as soon as their intentions stray from that of the heart back to the dominant stomach. Cherry Barbs are avid little egg-eaters and will soon devour a good spawning if left to their own devices.

The fry will hatch in about 24 hours and for the first week should be fed on infusoria. By the second week brine shrimp can be given; this can then be followed with micro worms, graded daphnia and dried food.

When the fry reach a length of one-quarter inch they can be placed in roomier quarters to allow for growing-on. Any fouling of the water by uneaten food, waste, etc., can be held in check by the addition of a small species of *Corydoras*, which is completely harmless to the fry.

Breeding goldfish

The Importance of space

by A. Boarder

In PREVIOUS articles on breeding goldfish I have often stressed the importance of warmth, feeding and aeration. I will now deal with the space question. It would be difficult to state which of the four conditions, is the most important but it is possible to give the fact that if any one of the conditions is missing then the whole breeding technique will be at fault.

In the articles I wrote on the breeding of the fan-tail goldfish which were bred in September, 1967, I described the rapid growth of the fish under warm treatment with aeration and correct feeding but the question of space was not emphasised. I was only dealing with fifteen fish in these conditions and so had sufficient space available in which to spread out the fish as they grew. After two or three months there were not more than four fish to a 24 x 12 x 9 in. concrete tank, outside measurements.

This gave the fish plenty of swimming space in which they thrived exceedingly well. The fact that one female spawned when eight months old and that hundreds of fry were produced was a certain proof that the fish had had enough room in which to develop properly. However, the number of fry from this spawning presented a problem as far as providing sufficient swimming space. As I have reported previously there were so many fry in the two spawning tanks that it was quite obvious that if I was to raise a good number of them it was essential that they were spread out into more tanks.

A large number were removed and put into other concrete tanks and also some went into three cold-water cisterns which I had floated over with cement wash many years ago. These tanks had been partly filled with brick-bats, etc., and concreted over so that their depth was not more than about nine inches. I am not in favour of deeper tanks as I contend that the water at the bottom or near it does not get sufficient oxygen and the fry never stay there for long. The fry were removed from the hatching tanks by the aid of a small enamel saucepan. This was dipped carefully into the tank and the fry were counted as they were slowly emptied into another tank.



Each dip into the hatching tank brought up very many youngsters. Up to the time of writing when the fry were about five weeks old, I have taken out one thousand three hundred and seventy of them. The two tanks in which they hatched still contain many youngsters but it is, at the moment, impossible to estimate how many are still there. The tanks are well stocked with plants and blanket weed and the fry cannot be seen very easily except at night when I use a torch. I am inclined to believe that there must have been about two thousand fry in the two tanks and these were from one eight-month-old female only.

The fry which were moved to other tanks have grown larger than those in the hatching tanks which were left behind, although food has been given to all of them at about the same rate. This early moving of many of the fry is not a project which I recommend but it was quite impossible to leave all the young in such crowded conditions. I know that many fry were lost during the transfer to other tanks. When very small they are easily upset and also the water in the new tank may be very different from



that where they were hatched. I do not recommend moving the fry until they are about a month old as before that they are very susceptible to any violent change. At the moment I have nine concrete tanks and three cisterns with fry at varying sizes. Some have warmth and aeration and others have neither. The concrete tanks are in an outdoor frame which gets quite warm when the weather is suitable but the cisterns stand partly buried outside with sheets of glass on top. This glass is to stop birds from getting at the fry and also to attract any extra warmth which can be obtained.

When the fantails had spawned they were put into my garden pond where they appeared to be very contented. On my return from holiday on 15th June, I found many more eggs on the spawning bunches of weed in the pond. The fish which spawned may have been some of those which were hatched in September, 1967, or a few of my older fish may have been responsible or have joined in. By the look of the eggs I am sure that they had only been laid that morning. Freshly laid eggs of goldfish have a

decided amber tint to them when the bunch is lifted from the water and after the first day they become clearer and almost transparent, but the infertile ones go mouldy and show up white. The bunches of weed with eggs were placed in one of the outside cisterns and covered with sheets of glass. After about four days many fry hatched out and I decided to leave them in the same tank for as long as possible to see how they fared. They were given 'Liquifry' at once and appear to be growing, although as the weather turned cooler it is probable that they will not grow very quickly. However, I can now experiment with them and see for how long they can be left in this crowded condition. The tank is roughly two feet square and has a shallow depth. By inspecting the tank at night with a torch it is possible to see a large number of fry, probably several hundred.

I intend to feed them as usual but to refrain from taking any out for some time to see how long they can remain healthy in crowded conditions. I know that when they are very tiny it is possible to crowd them without trouble but at what age it is essential that they are moved will be obvious as time goes by. I am inclined to the belief that the fish which spawned could be the ones which spawned in May as I have found on many occasions that these fish spawn at monthly intervals. However, I have no means of knowing if the eggs procured were from the young fish or from any of the older specimens in the pond.

Some years ago I found a young fantail in a tank which I had presumed to be free of fish. This tank had been left with water in but no food of any kind had been given. The fish was quite healthy and had grown as well if not better than other fish of the same age which had been fed in the usual manner. This is another instance of the importance of space which must be provided if the fish are to grow at their maximum. I shall watch the fry in the later hatched batch to see how long they can remain in such crowded conditions without becoming unhealthy. I do know from previous experiments that when very tiny the fry can be crowded without coming to harm but once they are more than three weeks old I believe that they must have more space or they will suffer.

Autumn bulb planting for the pondkeeper

by Jas Stott

ONCE AGAIN, with the approach of Autumn, thoughts turn to the planting of the Spring flowering bulbs. Carefully selected and sited, a few clusters of some of these Spring-time beauties can be just as attractive and useful in the pond surround as in other parts of the general garden.

When making a selection for pondside planting from the many species and varieties available these days, some thought must be given as to the type and design of pond with which they are to be associated. For instance, the Darwin form of Tulip would be totally out of place if used in the surround of an informal or alpine type of pool or, conversely, so would the use of the miniature *Bulbocodium* or the *Fritillarias* with the large, formal set-up. The manner in which they are planted is also important if the right effect is to be produced; the odd bulb planted here and there usually produces a paltry effect, lacking strength, unnatural and doing little justice to the subject. With the informal design of pond, planting in clusters gives the right effect while the formal designs call for geometrical mass planting of the appropriate subjects. The alpine pool with its pronounced build-up of rock edging and outcropping calls for bulb planting in flowing drifts down the slopes

between the rocks.

For the informal lay-out some of the miniatures planted in drifts down the higher slopes produce a delightful show, and with some of the early flowering species, at a time when colour is most needed at the pondside. There is a dainty variety of *Scilla* which is a change from the usual blue of this species and is the rose coloured *S. bifolia rosea* growing to a height of some three inches and requiring a planting depth of around three inches. Another attractive species is the Lebanon Squill, *Puschkinia scilloides*, which bears flowers the palest of blue-white striped down the centre of each segment a deep blue. Growing to a height of around six inches it requires a planting depth of three inches and looks best when planted in thick clusters.

There are one or two varieties among the Grape Hyacinths suitable for the pondside and always on the look-out for something a little unusual my first suggestion is *Muscari comosum phoenicum* which, unlike all other varieties, bears flowers of an attractive feathery appearance in a lovely shade of violet-blue during May. It looks well when planted in clusters and needs a planting depth of three to four inches. For the smaller pond and its surround the



dainty little species *Muscari botryoides* is to be recommended; light blue in colour the flowers are on six-inch stems and bloom in April. To go with this variety there is a white variety *M. botryoides alba* blooming at the same time.

Some of the miniature Daffodils are most useful among which the following varieties can be recommended. *Narcissus bulbocodium*, *N. cyclamineus*, *N. triandrus* and *N. joncifolius* to mention but a few suitable for the average sized garden pool. All appear at their best planted in clusters or if the somewhat larger varieties are used such as *N. pseudo-narcissus*, *N. poeticus* or the *Jonquilla narcissus* with a more spacious set-up where a grass bank or edging is available, look attractive when planted in drifts.

Somewhere in the accentuated rock edging of the alpine pool should be found a place for the Fritillarias, and although a fairly large genus, many species and varieties are difficult to cultivate especially in our open gardens and call for speciality cultivation and so for this reason I recommend but one and its varieties: *Fritillaria meleagris*. It flowers on stems fifteen inches tall in April-May and requires a planting depth of four inches. The three varieties suggested for our purpose are *Aphrodite*, a white, *Artemis*, grey-purple, and *Sulphuris*, ivory spotted with mauve. For the larger, informal surround offering at some point a lightly shaded position where they can be planted and left undisturbed, the handsome Crown Imperial Fritillary, *Fritillaria imperialis*, should be seriously considered as a likely subject. Its large, leafy stems three feet tall and attractive in themselves, will be surmounted in May by distinctive flowers topped by a crown of glossy leaves. The bulbs should be planted five inches deep in compost enriched soil. There are several varieties ranging in colour from the normal yellow to deep red.

Mention was made earlier in this article of the Darwin Tulip, a grand subject, by the way, for use as a massed planting in beds surrounding a large formal pond lay-out. There are, however, some smaller species, much beloved by the alpine gardener and collectively known as the "Botanical Tulips" among which are several species and varieties very suitable for planting in pockets on the rockery slopes of the informal pond surround offering, when planted in clusters, high lights of colour in the early Spring. The first to come to mind is the glorious *Tulipa imifolia* with its glowing, scarlet cup-shaped flowers six inches high. Then the April flowering *T. batavica*, a soft chrome-yellow of similar height and its variety *Bright Gem*, softer yellow but with a lovely salmon-pink flush towards the base of the flower. Growing about twice the height is *T. chusiana*, cherry red and white while the star-like flowers of *T. sarida* growing on five-inch stems offer a delicate shade of greenish-yellow and white. Another large Tulip suitable for mass

planting in beds siding a formal pond is the Parrot Tulips with their massive, marginal fringed flowers on stems two feet tall making an impressive sight. The most popular variety is *Fantasy*, pink and green-yellow, but for my money, *Therese*, red and orange is outstanding. As a contrast to these, in a nearby position, the Rembrandt Tulips are to be recommended.

In preparing for our Springtime Bloom at the pondside we must not forget the capabilities of the Crocuses for providing colour, and with this subject, very early colour if the right species and varieties are selected. As far as pondside planting is concerned I look upon the Crocus simply as an early colour provider and, therefore, limit selection to a couple of species which will do just that because there are many other subjects to produce bloom later in the Spring. First, one which may be described as a late Winter flowering Crocus for in a mild winter later January may see it in bloom; it is *C. imperati*, the flowers are fragrant and a mixture of pale violet and dark cream with deep violet feathering. The second is *C. biflorus* with white flowers striped in deep purple. Both should be situated, if possible, in a south facing rock pocket and planted in clusters three inches deep.

With these Crocus there is an Iris which will frequently accompany them in bloom given a mild Winter and that is the miniature Iris *danfordiae*, three inches tall with golden-yellow flowers. This also should be given a well protected, south facing rock pocket with good drainage. Flowering a little later, say around early March, is the sweet scented *Ireticalata*, another miniature very suited to the rock edging of the pond, bearing lovely, deep purple flowers with golden blotches on the falls. Here again to secure really early bloom; a well protected, sunny pocket is called for.

Two final subjects which must be mentioned for they are extremely attractive and well suited for our purpose; The *Chinodoxas* and the *Snowdrops*. Although in common use it is usually the basic variety of each subject that is planted. There are, however, several varieties available these days which have much to commend them. The most common *Chinodoxa* to be seen is *C. luciliae*, the bright blue variety but there is a lovely pink form *C. luciliaerosa* of which *Pink Giant* is to be recommended. Another is *C. sardensis*, a beautiful rich, dark blue. They should be planted two inches deep in clusters.

The Common Snowdrop is *Galanthus nivalis*, which is quite attractive but the double variety *G. nivalis flore-pleno* is a charmer. The most distinctive variety, however, most suited for our purpose, is one of the large flowered forms of *G. n. maximus* named *Straffan*. This should be planted a little deeper than is usual with Snowdrops, say around five inches and in soil containing a fair amount of leaf mould.

The pygmy yellow lily

by B. Fry

MORE AND MORE PEOPLE fortunate enough to possess a garden are adding to its attractions by installing a pool or pond. Even the smallest ornamental pool, say, one contrived out of a discarded kitchen sink sunk in the ground, preferably among rockwork, and masked around the edges with slabs of weathered stone interspersed with hummock-forming saxifrages and prostrate-growing thymes, will quickly become a garden feature capable of providing fascinating interest and beauty for eight or nine months of the year.

For growing in a tiny pool itself there is no shortage of accommodating submerged plants, but of miniature water plants with showy flowers there is a limited choice. One of the finest of this select band is the pygmy lily *Nymphaea pygmaea helvola*. Just a few weeks back my own *N. p. helvola* came into flower. It is, as always, a perfect delight. The flowers are about 1½ in. across and of a party dress yellow deepening to almost orange in the centre. The flowers are produced all summer and open like celandines to soak up the golden warmth of the sun. The leaves are olive green to maroon with some darker marblings.

N. p. helvola is hardy anywhere under a few inches of water over four to five inches of mud, that is planted direct into a loamy or clay bottom. Alternatively it may be planted in a perforated deepish dish or tray of gritty clay with about a half teaspoonful of ground bonemeal mixed in.

This lily is also suitable for a proper pond, provided it is planted in the shallows—in water no deeper than 10 in.—and is not allowed to become smothered by rampant-growing marginals such as brooklime (*Veronica beccabunga*) or any of the strangling sedges. The pygmy yellow water lily is never dirt cheap. A plant costs about 27s. but it is readily available from May onward from most specialist growers of pond plants and is one of the best investments any lover of flowering plants can possibly make.



The golden orfe

by B. Fry

OUTSTANDING among the fishes for a garden pond is the golden orfe. This fish—a natural sport or colour variety of the common grey ide (*Idus*, or as it is called in some books *Leuciscus idus*) originally came to us from south Germany, where it is the most popular fish for ornamental waters. Its introduction into this country probably took place about the middle of the last century.

The golden orfe is a much more lively swimmer than the goldfish, and seldom leaves the surface (except during cold weather when it retires to the lower levels—for warmth) for more than a few minutes on end. It eats a lot—active fishes do—and is a relentless exterminator of gnats and flies and the rest of the winged fraternity. But besides these things it is always ready to snap up the odd worm, maggot, tiny piece of meat, cooked vermicelli or regular dried food thrown into the water by its owner.

The body is long and slender—as streamlined as a narrow sardine when immature—and shading from a lovely pinkish gold on the back to a whiteish gold to silvery white on the belly. The eyes are large, the pupils like polished jet; the iris pale gold. There are no barbels on the mouth.

During the breeding season, that embraces the months of April to early June, the body of a well-grown female—sexual maturity is attained when the fish is about 10 in. long (maximum size is about 16 to 18 in.)—becomes swollen and the male develops tiny pimples or tubercles, that are scattered over the sides of the head, and sometimes, the pectoral fins and other parts of the body.

Spawning takes place in the shallows among tangles of plants—the male is a vigorous driver—and the eggs hatch out within the space of about 21 days. Newly hatched fry measure about ¼ in. long and are leaden coloured. The golden colour is assumed at a later stage of their development.

The golden orfe is a shoaling fish and seems, and no doubt is, happiest when it has the company of several of its own kind. With no overcrowding and proper care it should live in a garden pond for upwards of ten years.

Copenhagen aquarium show

THE ANNUAL COPENHAGEN AQUARIUM SHOW opens on the 30th of August 1968 at the Royal Horticultural Society's Exhibition Hall in Copenhagen, and will close on the 8th of September.

This year the show is arranged by Denmark's oldest and largest aquarium club, The Copenhagen Aquarium Society, under the protection of H.R.H. Prince Knud of Denmark.

It is the intention of the Copenhagen Aquarium Society to make this a memorable occasion by including an International Killifish Show, inviting Killifish fans from all over the world to participate. Therefore, the arrangements are made in co-operation with the group Copenhagen Killies, and the Society has succeeded in persuading the world renowned Killifish expert, Colonel J. J. Scheel, to undertake the important task of judging the entries.

Prizes will be awarded in the following classes:

1. Aphlocheilus and Pachypanchax.
2. Nothobranchius.
3. Aphyosemion and Rofoffia.
4. Epiplatys.
5. Procatopodinae and Lamprichthyinae.
6. Other old world rivulini.
7. Rivulus.
8. Cynolebias, Cynopocilus and Simpsonichthys.
9. Austrofundulus, Rachowia and Pterolebias.
10. Other new world rivulini.
11. Breeders Class. Bred within 6 months. (Minimum 6 fish).

There will be a special award for the best fish in the show. All participants will receive a diploma showing the placing and points obtained in the class, and a special diploma will be given to the rarer fish.

The greatest care will be taken of the fish, and any special instructions given by the owners will be carefully followed. For your information the Copenhagen tap water has a hardness of 16-18 pH, and is more or less neutral as far as acidity goes. A minimum of one pair must be entered, and in the breeders' class at least 6 fry or young fish.

Please send your fish to Leif Christensen, Skottegaarden 49, 2770 Kastrup, Denmark, and mark clearly with name and any special instructions. The fish must arrive not later than the 29th of August, and preferably a couple of days before. Notification specifying entries in the show must be sent by post-card to arrive not later than the 20th of August.

After the show the fish will be returned to their owners at the expense of the Copenhagen Aquarium Society, unless the owners wish them sold and the money forwarded instead.

The Copenhagen Aquarium Society cannot accept responsibility for losses incurred through transport and during the show.

It is our intention to make this the Killifish occasion of the year, and at the same time to encourage increased interest in this field.

Should any aquarist wish to visit Copenhagen in connection with the show, the Society will do their utmost to make their stay in Copenhagen most enjoyable.

May we extend a hearty welcome to all Killifish fans!



Final reminder!

Entries close soon for the

"Champion of Champions" Contest

at the British Aquarists' Festival
Belle Vue, Manchester, 26th, 27th Oct.

The winner of the 'Champion of Champions' contest will be awarded a Hall-marked 9ct gold lapel pin in the shape of *The Aquarist* badge inscribed—'Champion of Champions'. A cash prize of twenty guineas together with an inscribed plaque will also be awarded. A similar plaque will also be awarded to the second and third successful contestants together with a cash prize of thirteen guineas and seven guineas respectively.

Last date for Entries: 30th September

The Contest, sponsored by *The Aquarist and Pondkeeper*, is open to winners of "Best Fish in Show" awards won at an Open Show, i.e., open to any member of the public and not by invitation only, and where Show Schedules are available. Winners who have not received an acknowledgment are requested to contact us; all correspondence to "Champion of Champions," *The Aquarist and Pondkeeper*, Half Acre, The Butts, Brentford, Middlesex.

Our Readers Write

Fluorescent Lighting

I was interested in Mr. Mills' article in the July issue of the *Aquarist*, but feel that I must give my own comments on the economy in current consumption which he stresses.

Although I have a fair electrical knowledge, I had no experience whatever of fluorescent lighting until I recently installed an 18 inch Gro-Lux tube over a 24 inch tank.

I was surprised to find that, although the tube functioned perfectly well, the control unit very soon became too hot to touch. This set me thinking, and I proceeded to measure the power flow into the unit by two entirely different methods. The answer was the same in each case; the consumption was 100 watts. Presuming the lamp to be taking its rated 15, this meant that 85 watts were being used to "boil-up" the control unit.

I tried a second control unit and a different 15 watt tube and, finding the consumption to be still the same, scoured round to find literature on fluorescent lighting.

All the sources of information stressed that the power-factor of a choke/lamp combination is very low, and that a suitable capacitor should be connected across the mains input to the unit to afford some correction of this factor.

Investigation showed that neither of the control units in my possession had such a capacitor, but consisted solely of a series choke and the starter.

A search through my radio "junk" produced various capacitors, and I finished up with 4 microfarads across the mains input. This has reduced the wattage input to 25. A loss in the control is quite inevitable, but 10 watts is considered to be a reasonable figure.

A word of caution. Any capacitor used in this way must be rated to stand the peak voltage of the mains supply. That being so it will be a fairly large device. Probably about 8 cubic inches for 4 microfarads.

Electrolytic capacitors, although much smaller in size, are quite unsuitable for this purpose, and must not be used.

I have not tested any tubes other than the 18 inch, 15 watt, but I would guess that Mr. Mills' new set-up is taking rather more current than his earlier 4 multi 40 watt tungsten lamps.

S. C. BARRELL,
El Nido, Leigh Road,
Cobham, Surrey.

Wanted: Contact with Australia

I am interested in having a pen-pal in Australia, so could you please send me the addresses of any Australian Fish Societies in Perth, Sydney or Melbourne.

If you cannot help could you please tell me who could?

KEITH M. PACE,
16 Ravenhill Crescent,
Leasowe, Wirral, Cheshire.

Perhaps some of our Australian readers could oblige by writing Mr. Pace direct.—Ed.

Marine Aquaria Judging

Dear Sir,

I have followed with interest the controversy between the F.B.A.S. and the I.M.S.S. over the judging of marine aquaria. Although I kept marines for seven years, I only ventured to show for the first time at the National Furnished Aquaria Competition in Bradford. I was very disappointed at the poor response in the marine section. I think it might have been better if the marines had been able to compete in the main section instead of being kept separate, the open first prize being £100 compared to £10 in the marine section. (Even if we had won, the latter would not have covered our costs). To this end I think it is best to use the F.B.A.S. system which gives an equal chance to both types when competing together. If, and when, we eventually get sufficient numbers to hold marine shows, then a new system will be a necessity.

My main complaint is not about the points system, but about the whole conception of what constitutes a beautiful marine set-up and in particular about the judging of coral. I have had six years' experience as a diver in tropical seas and therefore have a good idea of what a coral reef looks like. The marine tanks I have seen in Britain do not even begin to bear any resemblance to the real thing. Naturally we cannot keep living coral here, but do we have to keep it whiter than white and with that most unnatural horror, white sand?

A good growth of algae not only gives the coral a more natural appearance, but is an essential part of the diet of most marine fish. For the Bradford show I cultivated different types of algae in bowls outdoors. Thus, I had a variety of green and brown coral pieces for my tank. At the show I was very pleased with my points score except that I fell down badly on "condition" in the coral section. On enquiring about how the condition of coral was judged, I was horrified to learn that it was judged for "whiteness and brightness".

Surely, the aim in setting up any furnished aquarium should be to achieve a natural appearance. I know that not everyone can see a real coral reef, but a glance at the photographs in a Hans Haas book would give the right idea. In my opinion, judging coral like a soap advert is equivalent to saying "plastic plants only" to fresh water aquarists.

For me the highlight of the year was the article "Marines—The natural method" by Graham Cox in the January and February "Aquarist". I earnestly recommend all marine enthusiasts who didn't read it to do so without delay.

If I have given any impression that I feel critical of the abilities of the judges at the Bradford show, this has not been my intention. I would, in fact, like to thank all those people, two of the judges included, who were so helpful at Bradford. Even to the gentleman who offered to tell me how to clean my coral—"Thank you".

D. W. SANDERSON,
Churchtown,
Southport, Lancs.

Our readers write

My Tip

WHILST RECENTLY setting up a new bow-fronted aquarium, after planting the plants, fitting the heater etc., the usual thing would have been to have used paper to protect the plants before putting in the water.

My usual method was used, unlike others I feel paper of any sort may contain contamination so I use the insulating sort better known as "Kotina". This for a short while is non-absorbent, easily floats and does not damage the internal set-up of the tank and is hygienic. I have used this for a long while also for removing slick etc. that may appear on the surface; it also does not worry the fish like printed paper, or brown paper that darkens the tank. I am sure there are many aquarists who would welcome this suggestion.

Yours faithfully,
Derek Brown (11yrs)
Marlborough Farm,
Falmouth, Cornwall.

Plants and Lighting

I WAS SURPRISED that your correspondent Mr. R. C. Mills quoted 35/- as the cost of fitting fluorescent lighting to his tanks. I have fitted my tanks for 45/- with Gro-Lux. The Gro-Lux tube was purchased from my local fish dealer. The control gear was bought as a kit from Electronics (Croydon) Ltd. of 102 Tamworth Rd., Croydon for only 19/-. Incidentally they advertise that this will include a tube next month.

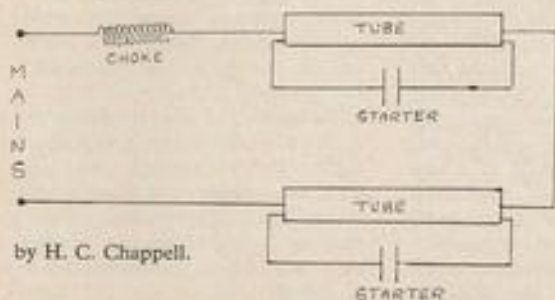
I agree with Mr. Mills's findings in the short life of incandescent bulbs, however there is a type marked R.S. for rugged service at a small extra cost which gives a longer life in the horizontal position.

There is no restriction on the length of the interconnecting wires and I would strongly advise that the choke, which is very heavy, should be fastened to the stand rather than the head.

There is no doubt that plants grow extremely well with Gro-Lux but certain kinds are incompatible. Could someone provide a list of compatible plants for amateurs like myself, as it would save a lot of heart-ache and expense. After all, the fish books refer to community or non-community fish. Why not a similar classification for plants?

If any of your readers can obtain fluorescent fittings from demolished shops etc., can I point out that any number of tubes can be run from one choke provided the power-rating in watts of the choke is not exceeded.

The diagram is:—



by H. C. Chappell.

tropical queries

continued from page 531

the male donned breeding colours and turned very aggressive. I think it was very deceitful of the dealer not to warn me about this when I bought the fish. What is your opinion?

A lot of fishes with a strongly developed protective instinct turn spiteful when they are about to become parents. Their aim, naturally, is to perpetuate their species. No dealer would think of warning a customer about this because (a) in a properly planted aquarium there should be sufficient cover for the other occupants to make themselves scarce when danger threatened, and (b) the fever of love soon passes off and the amorous fish become their normal quiet selves again, that is, until the next time.

Is it true that the coloration of the compost has a marked effect on the coloration of a fish?

We would not go so far as to say the coloration of the compost has a marked effect on the colours of a fish, but there is no question that a dark compost does have an influence on the pigment cells (Chromatophores), and in most cases a brilliantly coloured fish, or dark-hued fish, wears better colours when it swims over a dark bottom.

I have heard of a fish popularly known as the Nile Perch. May I have the scientific name of this fish, and its suitability as an aquarium inmate?

Lates niloticus is the scientific name of the Nile Perch. Small specimens may be kept in an aquarium, but the fact that the fish grows into one of the largest freshwater fishes known (the female of the species may exceed 350 lb. in weight and 5 ft. in length) rules it out as an aquarium species. Apart from all this, it has a tremendous appetite for smaller fishes.

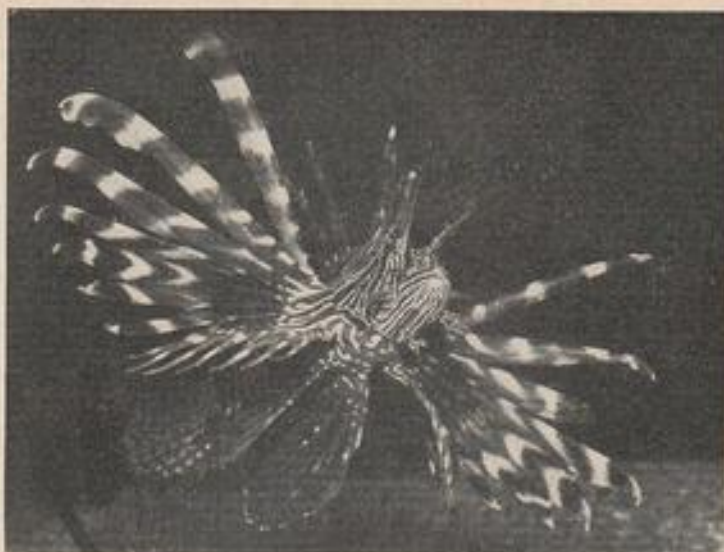
CORRECTION

Among readers' queries answered in our issue of July was one concerning a killifish long called *Aphyosemion sjoestedti*, or the golden pheasant. Mr. E. J. Seymour, Technical Editor of the British Killifish Association, has reminded us, however, that there have been some changes in nomenclature, and the fish formerly known to aquarists as *A. sjoestedti* should now be called *A. coeruleum*. The golden pheasant has been placed in a new genus, *Rodolffia*, and henceforth this fish should be known, that is scientifically, as *R. occidentalis*.

Solution to "Find the fish"

see page 527

Answer, COLISA CHUNA



The Scorpion Fish

by Trevor Wild

TO SOME READERS this name will be immediately familiar. Others will remember this creature by other names such as dragon fish, butterfly cod, cobra fish, lion, zebra, tiger, feather, turkeyfish, cardinal, and sea pig. For our purposes, however, we shall use the generic names, *Pterois* and *Dendrochirus*. Of these, the *Pterois* species are the ones most commonly imported. This is no doubt due to their more robust manner and their apparent eagerness to settle down to life, be it ever so humble, in the community tank.

The one major drawback with all scorpion fishes is that they are all venomous. Of this fact there can be no dispute. The poison is injected from the hollow dorsal spines. If all the spines penetrated the owners' hand whilst he was netting it, the neurotoxin would be released and the aftermath could quite easily be fatal. If by some chance you find yourself in such a position, then immediate action should be taken, as death can ensue two hours after the puncture of the flesh. Small quantities of diluted ammonium chloride must be swallowed, a nasty task, and penicillin and adrenalin

injections have to be taken. Unless this procedure is followed the patient will become convulsed and die an agonising death.

Now the few remaining readers will wonder what is the point of keeping a possible killer in the living room? The answer is quite simple. Our charming friend is not an indiscriminate murderer, constantly on the look-out for human arms hovering near the aquarium or nose-y fishes. Scorpion fishes only attack when they are hungry (no records exist which state that scorpions are man-eaters) or when they are being threatened (surprising as it may seem, the scorpions do have some enemies).

Now I have convinced you that a marine aquarium is incomplete without a scorpion fish I had better explain how to go about providing for its needs.

To understand what conditions are required, we must learn a little about our inmates' environment. To begin with, both *Pterois* and *Dendrochirus* live in exactly the same sort of area. Obviously, they do not live amongst the corals and the anemones, but in the nooks and crannies of some

dark rock formation in deeper waters unfrequented by the bothersome reef inhabitants. The skin is dappled brown, tan, cream and various shades of white, with which to blend in, unobserved and unnoticed down by the shady caverns. All fins display colours similar to those previously mentioned. The dorsal finnage is certainly unmistakable. Long graceful rays adorn the back and it is these which carry the venom from the sacs under the fins into the puncture created by the spines. The first ray acts as a kind of sensory organ or feeler. All finnage is much larger than that found on any other marine fish. The object of these vast sail-like wings remains as yet unknown and one can only guess as to their specific function. Perhaps they assist in propulsion, but it seems unlikely as speed is not a necessary factor in the fishes quest for sustenance. On the subject of feeding, it might be wise to describe the method of hunting used by the members of the family Scorpaenidae, to which *Pterois* and *Dendrochirus* belong.

Quietly our spiny friend lies in wait for a tasty morsel to come bobbing past. The unsuspecting prey wanders near what appears to be a pile of decaying plant life and as quick as a flash the weed turns into a ravenous scorpion fish. It is wise to bear this fact in mind when choosing prospective company for the scorpion. Inmates should be of a size large enough to prevent them finding their way into the one way mouth of your scorpion fish.

So now we are aware of the demands of scorpions we can go on to learn how to provide for them. The *Pterois* species are by far the easier of the two species to obtain and successfully keep. However, they can reach a size of two feet and so a tank of at least a hundred gallons must be used. With any other fish of the same size an even larger tank would be needed, but as *Pterois* are so lethargic one can get away with keeping them in a comparatively small tank. *Dendrochirus* scorpions

are more expensive but they rarely exceed a length of twelve inches.

The aquarium must have large quantities of coral in it but sufficient room must be left to enable the fish to completely unfurl his magnificent fins. More than one can be kept in the same tank but in this case the aquarium concerned must be of very large proportions and so this factor alone will limit most prospective *Pterois* keepers to just the one.

When transferring your fish to the aquarium, use a plastic bowl and not a net, or the finnage will be ripped. It will of course grow back to its original splendour, but why risk torn fins when all that is needed is a little care and forethought. Plenty of aeration is required and a good filter will remove waste products in the water. Scorpions are carnivorous so do not waste time, money and effort trying to feed them dry foods or greenstuffs. Guppies, both large and small are eaten with apparent delight and the same can be said for any other freshwater live-bearing tooth carp. Fresh shrimps, prawns, molluscs, crabmeat and the flesh of most other saltwater crustacea are all taken readily. On the whole, most scorpions are hearty eaters, but once in a while one will come across a fish which has gone on hunger strike. There is no need to worry as the fish will soon feel the pangs of hunger and will resume feeding again.

The amount of food the fish requires depends to a large extent on the dimensions and individual appetite of the fish. However, a small specimen about three inches long will consume between six and ten average sized shrimps per meal which should be at the rate of one a day.

Eventually, length of time depending on how well your particular scorpion fish knows you, he will come to the surface of the tank and take food from your fingers.

Choosing Your Specimen

There are many new species of fish coming into this country now and so it might be a good idea to list the

various types of *Pterois* and *Dendrochirus*. The points to look for when buying your fish are a full stomach, clear eyes and alert movements. Beware of the pretty fish sulking in the corner. Once you know what to look for you must decide on the species of the fish you intend to keep. First the *Pterois* species.

The most common of these is *P. volitans*. This is one of the giants among the scorpions, attaining a length of two feet. This should not worry the average marine aquarist, however, as they will rarely grow to this size in the ordinary community tank.

Another popular species is *Pterois radiata*. A really beautiful fish this and well worth buying. It is rather expensive, roughly £6 for a four inch fish, but the colours and shape are totally different from all other scorpions. The body is dark brown and banded with white. On top of this it has a white face and many more dorsal spines.

Many more species are sometimes imported, such as *Pterois miles*, *hondatus*, *antemata* and *russelli*. All these are not for the amateur, as they are often fussy feeders and rather prone to bacterial infections.

The *Dendrochirus* scorpions are on the whole, much smaller than the *Pterois*, and do better in the small aquarium. They are really ferocious looking with a multitude of spines.

Dendrochirus zebra is the most commonly imported of this family and is by far the hardest, and also the 'prettiest'. Black and white bands cover the entire body, and the fins have alternate black and white cross-bands. The rear dorsal and caudal fins are peppered with black dots on an otherwise transparent background. This fish seems to have a preference for small prawns which it swallows whole. There are a few others, but I have only seen these in public aquariums.

In conclusion, I would like to wish you the best of luck, and hope your scorpion fish, be it big or be it small, will give you many years of enjoyment.

DESPITE the fact that there were four Open Shows on the same day **Workshop Aquarist & Zoological Society** had a successful show attracting 331 entries. The Best Fish in Show was a magnificent loach entered by W. Parkin of Huddersfield. The complete list of prize winners is as follows:—Swordtails: 1, P. and H. Bone (Section winner) (Huddersfield); 2, Mr. Chamberlain (Hartlepool); 3, F. Woodward (Blackpool); Guppies: 1 and 2, Duffly and Beardsall (Nottingham F.G.A.); 3, D. Gould (Alfreton); Mollies: 1, A. Masson (Workop); 2, W. Scrimshaw (Rainworth); 3, E. Turnbull (Hartlepool); Platies: 1, Mrs. B. Harrison (Rotherham); 2, Mr. Harrington (Hucknall and Bulwell); 3, P. and H. Bone (Huddersfield); Barbs (Small): 1 and 2, H. Granwick (Featherstone); 3, J. Wright (Alfreton); Barbs (Large): 1, K. Parks (Section winner) (Merseyside); 2, A. and F. Stanforth (Creswell); 3, B. Jones (Workop); Characins (Small): 1, J. Allen (Section winner) (Ind.); 2, A. and F. Stanforth (Creswell); 3, S. Hill (Chapelton); Characins (Large): 1, L. W. Roe (Chapelton); 2, N. Kirby (Merseyside); 3, Mr. and Mrs. Cohen (Pontefract); Egg-laying Toothcarps: 1, H. Granwick (Section winner) (Featherstone); 2, Mrs. Bullyment (Nottingham); 3, D. Jackson (Rotherham); Danios: 1, D. Wragg (Section winner) (Alfreton); 2, N. Kirby (Merseyside); 3, B. Walters (Huddersfield); Rasbora: 1 and 3, Mr. and Mrs. Cohen (Pontefract); 2, P. and H. Gorton and Openshaw; Sharks, Foxes: 1, N. Kirby (Section winner) (Merseyside); 2, Master S. Hurst (Chapelton); 3, D. Robinson (Huddersfield); Minnows: 1, D. Wragg (Alfreton); 2 and 3, R. Senior (Sheffield); Cichlids (Dwarf): 1, L. Kaye (Top Ten); 2, Mr. Chamberlain (Hartlepool); 3, A. Masson (Workop); Cichlids (Large): 1, K. Binns (Nottingham) (Section winner); 2, J. Williamson (Hartlepool); 3, K. Parks (Merseyside); Angels: 1, Master S. Hurst (Chapelton); 2, N. Kirby (Merseyside); 3, A. G. Esteves (Top Ten); Catfish: 1, F. Mulla (Merseyside); 2, J. D. Fletcher (Creswell); 3, Mr. and Mrs. Anson (Stockbridge); Loach: 1, W. Parkin (Huddersfield); 2, D. W. Orgill (Rainworth); 3, Mrs. Bullyment (Nottingham); Fighters: 1, F. Mulla (Merseyside); 2, H. Granwick (Featherstone); 3, L. Kaye (Top Ten); A.O.V.: Anabantids: 1, P. and H. Bone (Huddersfield) (Section winner); 2, L. Kaye (Top Ten); 3, D. Gould (Alfreton); A.O.V.: 1, A. Masson (Workop) (Section winner); 2, Master S. Hurst (Chapelton); 3, A. Middleton (Gorton and Openshaw); Pairs (Livebearers): 1, J. Igoe (Rainworth); 2, Master S. Hurst (Chapelton); 3, A. Middleton (Gorton and Openshaw); Pairs (Egg-layers): 1, H. Granwick (Featherstone) (Section winner); 2, Mrs. Bullyment (Nottingham); 3, A. and F. Stanforth (Creswell); Breeders (Livebearers): 1, P. and H. Bone (Huddersfield); 2 and 3, R. Senior (Sheffield); Breeders (Egg-layers): 1, Mrs. Bullyment (Nottingham) (Section winner); 2, D. Wragg (Alfreton); 3, R. Senior (Sheffield); Juniors: 1 and 2, A. Middleton (Gorton and Openshaw); 3, P. Hodgkinson (Gorton and Openshaw); Coldwater (Goldfish): 1, V. Wright (Alfreton); 2, E. W. Eadon (Sheffield); 3, Mr. and Mrs. Anson (Stockbridge); Shubunkins: 1, E. W. Eadon (Sheffield) (Section winner); 2 and 3, C. Hill (Nottingham); A.O.V.: 1 and 2, E. W. Eadon (Sheffield).

THE Leigh A.S. open show results were as follows:—Guppies: 1, R. V. Brothwood (Gorton); 2, W. Smith (Merseyside); 3, Miss C. Brothwood (Gorton); Platies: 1, Miss B. Kaye (Huddersfield); 2, R. Preston (Belle Vue); 3, Miss P. White (Leigh); Swordtails: 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, J. Shepherd (Salford); 3, H. Greenall (Leigh); Mollies: 1 and 2, Mr. & Mrs. Standen (Loynes);

3, M. Jones (Valley); Small Characins: 1, Mr. & Mrs. Grimshaw (Sunnybrow); 2, M. Jones (Valley); 3, Mr. & Mrs. Standen (Loynes); Large Characins: 1, J. Murray (Belle Vue); 2, R. Moorcroft (Merseyside); 3, D. Thomella (Merseyside); Small Barbs: 1, J. Boardman (Leigh); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, Mr. & Mrs. Webb (Salford); Large Barbs: 1, Mr. & Mrs. Grimshaw (Sunnybrow); 2 and 3, P. and H. Gorton; Dwarf Cichlids: 1, D. Thomella (Merseyside); 2 and 3, W. Smith (Merseyside); Large Cichlids: 1, R. Moorcroft (Merseyside); 2, R. Preston (Belle Vue); 3, A. Matthias (Leigh); Anabantids: 1, P. Ledger (Ramsbottom); 2, Mr. James (Leigh); 3, R. Preston (Belle Vue); Toothcarps: 1 and 2, J. Boardman (Leigh); 3, J. Roberts (Nelson); Loaches: 1, Mr. & Mrs. Webb (Salford); 2, J. W. Hogg (Leigh); 3, Mr. Henshaw (Belle Vue); Catfish: 1, P. & H. Gorton; 2, C. Brothwood (Gorton); 3, R. Moorcroft (Merseyside); Sharks: 1, Mr. Leaver (Leigh); 2, Mr. Neeris (Warrington); 3, Mr. Yates (Leigh); A.O.V.: 1, Mr. & Mrs. Grimshaw (Sunnybrow); 2, Mr. Bewick (Warrington); 3, D. Thomella (Merseyside); Danios and Rasbora: 1, Mr. Cadman (Chorley); 2, D. Thomella (Merseyside); 3, J. Boardman (Leigh); Coldwater: 1 and 3, Mr. Walsh (Accrington); 2, Zelds (Leigh); Juniors: 1, Master D. Bond (Leigh); 2, Master Richards (Leigh); 3, Miss J. Peet (Leigh); Breeders Six Egg-layers: 1, I. Shepherd (Salford); 2, Mr. Gurnsey (Loynes); 3, K. Townsend (Lytham); Breeders Six Livebearers: 1, J. Shepherd (Salford); 2, R. V. Brothwood (Gorton); 3, D. Riddard (Leigh); Egg-layers (Pairs): 1, J. Shepherd (Salford); 2, Mr. & Mrs. Webb (Salford); 3, Mr. & Mrs. Grimshaw (Sunnybrow); Livebearers (Pairs): 1, D. Riddard (Leigh); 2, R. Preston (Belle Vue); 3, J. Yates (Leigh); Best in show: R. Moorcroft (Merseyside).

THE annual open show of the **Basingstoke and District A.S.** proved a great success and attracted 380 entries. Results were as follows: Common Goldfish: 1, W. P. Voysey; 2, J. Norris (Bracknell); 3, A. Marshall (Basingstoke); 4, Mr. Lamb (Basingstoke); Shubunkins: 1 and 2, V. P. Voysey; A.O.V. Fancy Goldfish: 1, V. P. Voysey; A.V. Pond or River Fish: 1, V. B. Hunt (Peartmouth); 2 and 4, V. P. Voysey; 3, R. Keeping (Basingstoke); Guppy: 1 and 2, C. Beets (Portsmouth); 3, R. Brown (Salisbury); 4, T. Sweeney (Basingstoke); Swordtails: 1, R. G. Cox (High Wycombe); 2, Mrs. M. G. Nicoll (Reigate and Redhill); 3, S. Cook (Salisbury); 4, M. Carter (Bracknell); Platies: 1 and 4, F. B. Young (Reigate and Redhill); 2, R. Wingrove (High Wycombe); 3, Mrs. Nicoll (Reigate and Redhill); Mollies: 1, Mrs. Nicoll (Reigate and Redhill); 2, D. V. Jones (Southampton); 3, F. Lange (Basingstoke); 4, R. Brown (Salisbury); Characins: 1, I. Goddard (Salisbury); 2, T. Walker (Guldford); 3, R. Wingrove (High Wycombe); 4, Mrs. Nicoll (Reigate and Redhill); Barbs: 1, R. Brown (Salisbury); 2, T. Errey (Basingstoke); 3, F. Lange (Basingstoke); 4, C. & V. Pike (High Wycombe); Danios: 1, Mrs. J. Wright (Gosport); 2, A. Blake (Basingstoke); 3, T. Errey (Basingstoke); 4, D. V. Jones (Southampton); Minnows and Rasbora: 1 and 4, T. Walker (Guldford); 2, R. Armstrong (Bracknell); 3, I. S. Peckham (Reigate and Redhill); Dwarf Cichlids: 1, P. Merritt (Reading); 2, A. Larkham (Salisbury); 3, A. Marshall (Basingstoke); 4, Master S. Box (Basingstoke); A.O.V. Cichlids: 1, M. J. Davis (Reading); 2, R. K. Willey (Salisbury); 3, T. Sweeney (Basingstoke); 4, I. Goddard (Salisbury); Siamese Fighters: 1, A. Blake (Basingstoke); 2, R. Keeping (Basingstoke); 3 and 4, Mrs. J. Scarle; A.V. Labyrinth: 1, P. B. Young (Reigate and Red-

hill); 2, S. Cook (Salisbury); 3, A. Blake (Basingstoke); 4, M. Carter (Bracknell); A.V. Catfish: 1, C. & V. Pike (High Wycombe); 2 and 4, J. Norris (Bracknell); 3, R. Wingrove (High Wycombe); Botias: 1, M. Carter (Bracknell); 2, L. Jordan (Bracknell); 3, A. Blake (Basingstoke); 4, Mrs. J. Wright (Gosport); Egg-laying Tooth Carps: 1, H. Armistead (Portsmouth); 2 and 4, R. Armstrong (Bracknell); 3, F. B. Young (Reigate and Redhill); A.O.V. Tropical: 1, R. Armstrong (Bracknell); 2, Mrs. J. Wright (Gosport); 3, M. J. Davis (Reading); 4, R. Brown (Salisbury); Coldwater Breeders Pairs: 1 and 2, V. P. Voysey; Livebearers (teams of four): 1 and 2, R. G. Cox (High Wycombe); 3, C. Beets (Portsmouth); 4, L. Little (Bracknell); Egg-layers (teams of four): 1 and 3, R. Armstrong (Bracknell); 2, C. & V. Pike (High Wycombe); 4, D. V. Jones (Southampton); Club Tropical Furnished Aquaria: 1, W. Ryder (Portsmouth); 2, D. Walls (Basingstoke); Club Coldwater Furnished Aquaria: 1, W. Ryder (Portsmouth); A.V. Single Plant: 1, R. T. Ridley (Basingstoke); 2, H. Gough (Basingstoke); 4, Len Jordan (Bracknell); The F.H.A.S. "Maise Trophy" for Characins won by I. Goddard (Salisbury); The F.H.A.S. "Championship Trophy" for Livebearers (teams of four) won by R. G. Cox (High Wycombe); "Best Fish in Show" awarded to C. Beets (Portsmouth); The "Ryan Cup" awarded to Tom Errey (Basingstoke)—(highest pointed fish entered by Basingstoke member); The "Speedy Edmonds Cup" awarded to Adrian Blake (Basingstoke)—(highest total points gained by Basingstoke member); The "Ron Keeping Tankard" awarded to Arthur Marshall (Basingstoke)—best Dwarf Cichlid entered by Basingstoke member.

THE results of the thirteenth table sold held by Brent A.S. were as follows: Corydoras: 1, T. D. Smith; 2, V. Coyne; 3, M. Abrahams; 4, H. Coyne; A.O.V. Cats: 1, T. D. Smith; 2, P. Abbot; 3, C. Hooper; 4, P. Shrimpton; A.O.V. Egg-layers: 1 and 2, P. Shrimpton; 3, T. D. Smith; 4, P. Abbot; Best in show: T. D. Smith.

THE results of the second annual show of the **Glossop A.S.** were as follows: Livebearers—Guppies: 1, H. Hilton (Stretford); 2, Mrs. Cross (Blackpool); 3, J. Shepherd (Salford); Swordtails: 1, H. Dermie (Workop); 2, Mr. & Mrs. Grimshaw (Sunnybrow); 3, W. Grey (Sunnybrow); Mollies: 1, H. Dermie (Workop); 2, B. Thompson (Glossop); 3, P. Bishop (Bishopton); Platies: 1, W. Bernie (Stockport); 2, F. Bishton (Valley); 3, R. Preston (Belle Vue); Pairs: 1, E. Fletcher (Glossop); 2, P. & H. Gorton and Openshaw; 3, R. Preston (Belle Vue); Small Labyrinth: 1, H. Dermie (Workop); 2, E. Kaye (Huddersfield); 3, D. Smith (Glossop); A.O.V.: 1, H. Dermie (Workop); 2, B. Jones (Workop); 3, K. Parkes (Merseyside); Fighters: 1, H. Dermie (Workop); 2, F. Mulla (Merseyside); 3, L. Stevens (Valley); Pairs: 1, H. Dermie (Workop); 2, A. Hudson (Huddersfield); 3, P. & H. Gorton and Openshaw; Small Barbs: 1, H. Dermie (Workop); 2, Mrs. Barry (Swillington); 3, F. Buxton (Barnsley); Medium: 1, A. Henshaw (Belle Vue); 2, M. D. M. (Glossop); 3, M. Stray (Halifax); Large: 1 and 3, K. Parkes (Merseyside); 2, Mr. & Mrs. Grimshaw (Sunnybrow); Pairs: 1, G. Hamnett (Huddersfield); 2, J. McCabe (Gorton and Openshaw); 3, P. & H. Gorton and Openshaw; Dwarf Cichlids: 1, M. Tonge (Oldham); 2, H. Dermie (Workop); 3, J. Shepherd (Salford); Medium Cichlids: 1, A. Henshaw (Belle Vue); 2, M. D. M. (Glossop); 3, M. Stray (Halifax); Large: 1, R. Moorcroft (Merseyside); 2, K. Scothorn (Halifax); 3, K. Parkes (Merseyside); Angels (Singles): 1, N. Kirby & Son (Merseyside); 2, G. Edmonds (Salford); 3, R. H. Savage (Mid Herts); Pairs: 1, J. Shepherd (Salford); 2, J. Williams (Oldham); 3, H. Naylor (Halifax); Small Characins: 1, P. Bishop (Valley); 2, J. Jackson (Stretford); 3, A. G. Esteves (Top Ten); Medium: 1, S. Harrop (Ousarn); 2, Mr. & Mrs. D. Standen (Loynes); 3, N. Kirby & Son (Merseyside); Large: 1, H. Dermie (Work-

top); 2, R. Moorcroft (Merseyside); 3, W. Page Valley. Pairs: 1, W. Parkin (Huddersfield); 2, N. Kirkby & Son (Merseyside); 3, J. Whitley (Aireborough). Single Cichlids: 1, J. Roberts (Nelson); 2, K. Townsend (Latham); 3, G. Richardson (B.K.A.). Pairs: 1, G. Richardson (B.K.A.); 2, A. Middleton (Gorton and Openshaw); 3, K. Hill (Heywood). Catfish and Loach: Corydoras: 1, A. G. Stevens (Top Ten); 2, P. Redman (Sunnybrow); 3, N. Kirkby & Son (Merseyside). A.O.V. Catfish: 1, R. Phillips (Ashton); 2, H. Derris (Workop); 3, F. Bishop (Valley). Loaches: 1, W. Parkin (Huddersfield); 2, Mr. & Mrs. Webb (Salford); 3, K. Greenwood (Glossop). Pairs: 1, F. Mulla (Merseyside); 2, R. Davies (Belle Vue); 3, M. Stray (Halifax). Carps and Minnows: Sharks, Labors and Plying Foxes: 1, R. Hughes (Gorton and Openshaw); 2, M. Stray (Halifax); 3, F. Mulla (Merseyside). Danios, Rasboras and White Clouds: 1, P. & H. (Gorton and Openshaw); 2, J. & D. Boardman (Leigh); 3, F. Bishop (Valley). Pairs: 1, J. & D. Boardman (Leigh); 2, A. Newall (Glossop); 3, E. Kirkland (Sunnybrow). A.O.V. Tropical: 1, Mr. & Mrs. Grimshaw (Sunnybrow); 2, L. Watson (Sunnybrow); 3, G. Hammett (Huddersfield). Goldfish—Fancy Goldfish: 1 and 2, A. Thompson (East Lancs.); 3, B. Rothwell (N.G.P.S.). A.O.V. Goldfish: 1 and 2, R. Wagstaff (N.G.P.S.); 3, W. H. Ramsden (N.G.P.S.). Native: 1, W. H. Ramsden (N.G.P.S.); 2, Mrs. Baxter (N.G.P.S.). Pairs: 1, Mrs. Baxter (N.G.P.S.); 2, B. Rothwell (N.G.P.S.); 3, W. H. Ramsden (N.G.P.S.). Marine: 1, M. D. M. (Glossop); 2, P. Reeder (Glossop). Mini Jars: 1, 2 and 3, D. Shields (Halifax). Breeders Teams—Livebearers: 1, M. D. M. (Glossop); 2, J. Shephard (Salford); 3, A. Hudson (Huddersfield). Egglayers: 1, H. Derris (Workop); 2 and 3, P. Buxton (Barnsley). Best Fish in Show (Arowana): Mr. & Mrs. Grimshaw (Sunnybrow A.S.).

THE first real open show staged by Cambridge and District A.S. proved a great success, and the attendance exceeded the 3,000 mark. List of Prize winners: Best fish in show: R. Thorne's Severum Cichlid. Club Furnished Aquaria: 1, Harlow and District A.S. 78 pts.; 2, Cambridge and District A.S. 72 pts. Individual Furnished Aquaria: 1, R. Edney, 76 pts.; 2, A. Hulyer, 73 pts.; 3, K. Able, 70 pts. Goldfish: 1 and 3, R. Russell; 2, A. Hulyer; Fancy Goldfish: 1, 2 and 3, S. Tibble. British Native: 1, Master A. Ott. Make Guppies: 1, Mrs. L. Thorne; 2, R. Mayne; 3, R. Thorne. Female Guppies: 1, M. Bradford; 2, R. Ott; 3, W. Sherwin. Platy: 1, G. Kilby; 2 and 3, R. Kerridge. Swordtails: 1, B. Davison; 2, D. Larder; 3, P. Abbott. A.V. Livebearer: 1, Mr. and Mrs. Gee; 2 and 3, Mrs. L. Thorne. Labyrinth: 1, A. Hulyer; 2, Mr. and Mrs. Gee; 3, Mr. and Mrs. Jeffs. Barbs: 1 and 2, B. Davison; 3, R. Savage. Corydoras: 1 and 3, G. Aylard; 2, W. Sherwin. A.O.V. Catfish, Loach and Botia: 1, D. Kempen; 2, A. Hulyer; 3, G. Aylard. A.O.V. Tropical Egglayer: 1, Hulyer; 2, G. Aylard; 3, D. Dant. Characins: 1, R. Dant; 2 and 3, R. Brown. Dwarf Cichlid: 1, R. Betts; 2, E. Sheppard; 3, A. Hulyer. A.O.V. Cichlid: 1, R. Thorne; 2, R. Savage; 3, Mr. and Mrs. Jeffs. Danio Rasbora: 1 and 3, R. Edney; 2, R. Thorne. Egg-layering Toothcarp: 1, J. Randall; 2, Mr. and Mrs. Jeffs; 3, W. Isgrove. Pairs: 1, W. Dant; 2, P. Langley; 3, Mrs. L. Thorne. Blood Livebearers: 1, Mr. and Mrs. Jeffs; 2, A. Hulyer; 3, R. Kerridge. Brood Egg-layer: 1, Mr. and Mrs. Jeffs; 2, J. Randall; 3, A. Hulyer. Plant: 1, R. Ott (Cryptocorne Beckton); 2 and 3, R. Betts (Valley).

DUE to business and other commitments several positions in the Glossop A.S. became vacant. These positions were filled as follows: Chairman, J. Ingram; treasurer, C. D. Macdonald; publicity, D. R. Chambers; secretary, Mrs. M. Ingram, 117 Station Road, Huddersfield, via Hyde, Cheshire. Phone Glossop 3234. The society thanks the retiring officers for their services in the past, and hopes they will visit the society when commitments allow. They would also like to take this opportunity to offer a welcome to all old and new members.

AT the July meeting of the Bournemouth Aquarists Club, members made detailed arrangements for the annual show. The table shows of the month were judged by Les James and Jack Jeffery, both of whom were recently appointed F.R.A.S. judges. The results were as follows:—Labyrinths: 1, Mr. Macfarlane; 2, B. Poole; 3, Mr. Ryan. Mollies: 1 and 2, B. Poole; 3, R. Travers.

Anyone interested in the hobby is cordially invited to attend our meetings, which are held on the first Monday of each month, at 7.30 p.m., at Kinson Community Centre, Pelhams Park, Kinson.

THE president of the Barry A.S., Mr. J. Brockhurst, was present at the June meeting of the club, and there were forty-five other members. The annual open show and the Barry Horticultural Show were discussed, and a slide-tape lecture entitled "The American Scene" was given which showed excellent examples of how fishkeepers in America go about this hobby.

THE Enfield and District A.S. held an inter-club show in conjunction with the Enfield Arts Council Summer Flower Show. The societies taking part were: Bethnal Green, Harlow, Tottenham, Chingford and Walthamstow.

The best fish of the show award was taken by B. Knock of Bethnal Green A.S. with a Bleeding Heart Tetra. The results were: Livebearers: 1, B. Mather (Walthamstow); 2, M. Smith (Walthamstow); 3, J. Oliver (Bethnal Green). Toothcarp: 1 and 3, J. H. Soanes (Harlow); 2, J. Day (Bethnal Green). Dwarf Cichlids: 1, Mr. Taylor (Walthamstow); 2, A. Currie (Chingford); 3, J. H. Soanes (Harlow). Danios, Rasbora and W.C.M.M.: 1, H. Sumner (Chingford); 2, E. Macarionnaigh (Tottenham); 3, J. Day (Bethnal Green). Characins: 1, B. Knock (Bethnal Green); 2, S. Mooney (Tottenham); 3, T. Gilman (Bethnal Green). Barbs: 1, R. Smith (Tottenham); 2, T. Mann (Enfield); 3, R. Kerridge (Harlow). Livebearer Breeders: 1, B. Mather (Walthamstow); 2, T. Gilman (Bethnal Green); 3, W. Patrick (Walthamstow). Egg-layer Breeders: 1, S. Mooney (Tottenham); 2, J. Oliver (Bethnal Green); 3, D. Nutt (Tottenham). Labyrinths: 1, T. Mann (Enfield); 2, S. Mooney (Tottenham); 3, E. Bartlett (Chingford). Catfish and Loaches: 1, B. Mather (Walthamstow); 2, B. Knock (Bethnal Green); 3, M. Smith (Walthamstow).

AT the end of the June meeting of the Gosport and District A.S. a table show was held, the results of which were: A.V. Barb: 1, Mr. Bridgen. A.V. Scavenger: 1, Mr. Clough; 2, Mr. Illick; 3, Mr. McKeever; 4, Master Perman. A.V. Labyrinth: 1, Mr. Bridgen; 2 and 4, Master Perman; 3, Mrs. Wright. Also held on the same evening was a quiz and a very interesting discussion with Mr. J. Stillwell, an F.R.A.S. judge, on fish showing and keeping.

THE Woking and District A.S. held its first inter-club show recently. Two other societies were invited and they were the Guildford and District, and Weybridge. This proved to be a most lively and entertaining meeting. While the fish were being judged, chairman Alec Stacey gave a short talk of the Woking and District's activities over their first and very successful year as a club, and invited comment from the chairman of Guildford and Weybridge respectively. There followed a mutual and often humorous swapping of information all round with much benefit to the societies concerned. Three classes of fish were judged: Characins, Barbs and Livebearers, and in the final pointing Guildford took the honours with a total of 16 pts., Woking having 12, and Weybridge 2. Now Woking members are looking forward to the return, and to what their members know will be another lively and social meeting.

AT the July meeting of the Pontefract and District A.S. members were entertained with a lecture by D. Carr, of Bradford, on preparing fish for the show bench. The society's annual outing will be on 15th September when a visit to Queensborough Fisheries is planned. Two

new members were enrolled, and the results of the monthly table show were: Breeders: Livebearers: 1 and 3, F. Gates; 2, D. & B. Cohen. A.O.V.: 1 and 2, F. Gates; 3, D. & B. Cohen. Danios and Rasboras: 1, F. Gates; 2 and 3, D. & B. Cohen.

THE Keighley Society had an enjoyable day when a coachload of enthusiasts went to Chester Zoo and were shown behind the scenes in the aquarium, and also saw the many varied attractions at the zoo.

The July meeting of the Society was held at Dean House when over thirty members met and were entertained with a lecture on the behaviour of cichlids by Mr. Bateman of Leeds. The table show winners were as follows: Fish of the month: Breeders: 1, Mr. Meloin; 2, Mr. White; 3, Mr. French; 4, Mr. Cummins. A.O.V.: 1, Mr. Bickle; 2, Mr. White; 3, Mr. Smith; 4, Mr. French. Novice A.O.V.: 1, Mr. Bickle; 2 and 3, Mr. Dearnley; 4, Miss Sawley. Junior A.O.V.: 1 and 3, Master White; 2, Master Shillam; 4, Miss Crossley. Future plans were announced by the secretary, Mr. A. Asquith, for the society, which included an inter-town contest in September with Hornsfort Aquarist Society. A preliminary announcement was made about the show to be held at the Drill Hall in March, 1969, for which societies from all over the north of England will be invited to compete.

AT the July meeting of Ealing and District A.S., the chairman, Mr. Laurence Sandfield, gave a report of his attendance at the recent quarterly meeting of the F.R.A.S. Afterwards, R. C. Mills was co-opted to the committee to be fund raiser for the society. Michael Sadler, 15, was voted in as the society's first junior committee member.

A panel of three has been selected to answer any questions put by members and they are A. Ankin, a local pet shop proprietor; R. C. Mills and C. Rainbow, who have both kept fish for several years. The meeting ended with the auction of various fish and a demonstration on how to furnish 4 in. by 4 in. show jars (for a competition within the society) by the chairman and the show secretary, Ray Savage. Table show results were: Catfish (including Corydoras): 1, A. Ankin; 2, E. Tagg; 3, A. Betteley. Siamese Fighters: 1, C. Rainbow; 2, R. Barrett.

THE open show results of the Kingston and District A.S. were as follows: A.V. Sword or Platy: 1, Mrs. M. Nicoll; 2, J. D. Wilson; 3, Miss L. Stevens; 4, J. E. Oliver. A.V. Molly: 1, J. D. Wilson; 2, B. Funnell; 3, W. Corby; 4, F. H. Vicker. A.O.V. Livebearer: 1 and 3, Mrs. L. J. Thorne; 2, T. J. Summers; 4, R. Cooper. A.V. Barb: 1 and 3, A. J. McCarthy; 2, J. Eggeman; 4, P. A. Grosvenor. A.V. Characin: 1, T. D. Smith; 2, H. Armitage; 3, R. Knock; 4, W. Wron. A.V. Cichlid: 1, R. J. Thorne; 2, P. A. Grosvenor; 3, R. York; 4, R. T. McMullon. A.V. Danio, Rasbora, W.C.M.M.: 1 and 2, R. Biggs; 3, W. D. Harper; 4, R. E. A. Partridge. A.V. Toothcarp: 1, R. Stocksrell; 2, W. Challenger; 3, W. Corby; 4, R. Cooper. A.V. Corydoras: 1, Mrs. M. Nicoll; 2, T. J. Summers; 3, K. Dryden; 4, T. D. Smith. A.O.V. Catfish: 1, G. Greenhalf; 2, R. T. McMullon; 3, T. D. Smith; 4, D. W. Ellis. A.V. Loach or Botia: 1, P. A. Gingers; 2, M. Bartley; 3, R. Cooper; 4, Mrs. M. Nicoll. A.V. Labyrinth: 1 and 2, J. D. Wilson; 3, R. E. A. Partridge; 4, P. B. Young. A.O.V. Tropical Egg-layer: 1, T. D. Smith; 2, P. A. Grosvenor; 3, K. T. Clough; 4, Sean Mooney. Breeders Egg-layer: 1 and 3, F. H. Vicker; 2, Mrs. J. H. Partridge; 4, R. Thatcher. Breeders Livebearer: 1, J. E. Oliver; 2, H. J. Thompson; 3, G. Greenhalf; 4, A. J. McCarthy. Common Goldfish: 1 and 3, T. Longstaff; 2, R. A. Dodkins; 4, Miss M. Sherwin. A.V. Shubonkin: 1, 3 and 4, R. Whittington; 2, Miss D. Morris. A.O.V. Fancy Goldfish: 1 and 2, Miss D. Morris; 3, R. Whittington; 4, R. E. Dudley. A.V. Native and Foreign Goldwater: 1, R. E. Dudley; 2 and 3, K. A. Melhuish; 4, R. Biggs. A.V. Tropical Pairs: 1 and 2, R. Biggs; 3, R. Cooper; 4, R. J. Thorne. Best fish in show: R. J. Thorne—C. Severum.

ALL previous records were broken at the Brighton and Southern A.S. open show. The total number of entries, including the guppies benched on the P.G.A. stand by the South London Section, amounted to 470. This was well up on any previous year.

The society's annual trophies were awarded as follows: Brighton Trophy, best fish in show and Aquarist Champion of Champions Pin—P. O'Brien, Thurrock A.S.; Dora Bryan Trophy, best furnished aquaria—E. R. Nicoll, Thurrock A.S.; J. Pelham Cup, best barb in show—C. Swinburn, Brent A.S.; T. J. Croucher Cup, best single guppy—M. Richardson, Radlett Section P.G.A.; The F.B.A.S. Plaque for Corydoras Catfish was awarded to Mrs. M.G. Nicoll, Reigate and Redhill A.S.

Results: Furnished Aquaria: 1, E. Nicoll (Thurrock); 2, K. Appleyard (Thurrock); 3, D. Soper (Brighton); 4, F. H. Vicker (East London Aquarist and Pondkeepers Assn. A.V. Platy: 1, E. C. Illip (Independent A.S.); 2, P. B. Young (Reigate and Redhill); 3, K. Appleyard (Thurrock); 4, Mrs. M. G. Nicoll (Reigate and Redhill). A.V. Swordtail: 1, P. O'Brien (Thurrock); 2, Mrs. M. G. Nicoll (Reigate and Redhill); 3, R. Siegmund (Crawley); 4, B. Davison (Mid Herts.). A.V. Mollie: 1 and 4, C. Withers (Mid Herts.); 2, L. Ainsworth (Brighton); 3, V. Aldis (Brighton); A.O.V. Livebearer (excluding Guppies): 1 and 3, T. J. Summers (Uxbridge); 2, A. Dawes (Brighton); 4, R. Cooper (Kingston). A.V. Characin: 1, Mrs. M. G. Nicoll (Reigate and Redhill); 2, H. Armitage (Portsmouth); 3, F. R. Kendrick (Freelance); 4, T. Walker (Guildford). A.V. Barb: 1, C. Swinburn (Brent A.S.); 2, P. J. Barnard (Mid Herts.); 3, J. Pelham (Brighton A.S.); 4, P. Waring (Worthing). Danios, Minnows: 1, D. W. Ellis (Kingston); 2 and 3, T. Walker (Guildford); 4, D. Soper (Brighton). Rasboras: 1 and 2, R. H. Johnson (Mid Sussex); 3, C. Swinburn (Brent); 4, N. J. Short (Mid Sussex). A.V. Fighter: 1, 2 and 3, D. C. M. Durrant (Thurrock). A.O.V. Labyrinth: 1, Mrs. M. G. Nicoll (Reigate and Redhill); 2, T. J. Summers (Uxbridge); 3, L. Ainsworth (Brighton); 4, D. C. M. Durrant (Thurrock). A.V. Egg-laying Toothcarp: 1, D. W. Ellis (Kingston); 2, J. Oper (R.K. Association); 3, B. H. Field (South Bucks); 4, H. Armitage (Portsmouth). Dwarf Cichlid: 1, M. A. Whittington (Brighton); 2, B. Pearson (Freelance); 3, H. S. Wood (Croydon); 4, Mr. Pollard (Kingston). A.O.V. Cichlid: 1 and 4, A. Withers (Mid Herts.); 2, B. Davison (Mid Herts.); 3, R. H. Savage (Mid Herts.). Corydoras Catfish (F.B.A.S. championship class): 1, Mrs. M. G. Nicoll (Reigate and Redhill); 2 and 3, T. J. Summers (Uxbridge); 4, A. Jamieson (Catford). A.O.V. Tropical Catfish: 1, E. C. Illip (Independent); 2, G. Greenhalf (Kingston); 3, N. J. Short (Mid Sussex); 4, P. Tee (Brighton). A.O.V. Tropical Egg-layer: 1, G. Greenhalf (Kingston); 2, R. Siegmund (Crawley); 3, F. R. Kendrick (Freelance); 4, A. Jamieson (Catford). Tropical Breeders (Livebearer): 1, J. Kall (Brighton); 2, R. Cooper (Kingston); 3 and 4, V. Aldis (Brighton). Tropical Breeders (Egglayer): 1 and 3, F. H. Vicker (East London A.S. and Pondkeepers Assn.); 2, D. W. Ellis (Kingston); 4, D. Soper (Brighton). Coldwater: Common Goldfish: 1 and 2, Mrs. P. Whittington (Reigate and Redhill); 3, V. B. Hunt (Portsmouth). A.V. Shubunkin: 1 and 2, R. M. Whittington (Reigate and Redhill); 3, R. Cooper (Kingston). A.O.V. Fancy Goldfish: 1 and 2, R. M. Whittington (Reigate and Redhill). A.V. River and Pond: 1, J. Stillwell (Portsmouth); 2, V. B. Hunt (Portsmouth); 3 and 4, J. A. Kettle (Independent). Fancy Guppy Association Stands: Best single guppy: M. Richardson; best opposite sex: T. Croucher; best breeders: T. Walker, Males; Cofer, Mrs. G. Brock; Top Sword, Mrs. V. Hibbert; Bottom Sword, M. Richardson; Double Sword, P. Curry; Seartail, Mrs. G. Brock; Original Veil, M. Richardson; Long Dorsal Veil, T. Croucher; Short Dorsal Veil, T. Croucher; Delta, Mrs. G. Brock; Fantail, C. Weller, Females; Roundtail, Mrs. G. Brock; Superba, T. Croucher; Metropolitan, T. Walker; Scallop-tail, T. Croucher; Wedgetail, T. Croucher. Colours: Males, W. Collyer; Female, Mrs. G. Brock. Breeders: Females, T. Walker; Matched

Males, D. Soper; Matched Pairs, D. Soper; Master Breeders, D. Soper; Exp. Males, D. Soper, Junior; A.V.: Miss W. Melton, Ladies: A.V.: Miss P. Carr.

THIRTEEN clubs and societies were represented, together with many competitors who were not attached, at the Bournemouth A.C. annual show, there being a total of nearly 350 entries.

There were twenty-three classes of entry, judged by F.B.A.S. Judges Mr. J. Stillwell, Mr. R. Matley, Mr. B. Coombes and Mr. T. James. The classes for Catfish and male Guppies attracted most entries, closely followed by classes for Gouramis and female Guppies. In the Coldwater section, the class for Common Goldfish proved to be the most popular. The results were as follows: Guppies (Male): 1 and 2, Miss P. M. Carr (Brighton); 3, T. J. Croucher (Brighton); 4, C. Beets, Guppies (Female): 1, J. Scott-Morgan (Bournemouth); 2, C. Beets; 3, T. J. Croucher (Brighton); 4, C. Beets. Swordtails: 1 and 3, R. Hemming (Bristol); 2, S. A. Garcia (Bournemouth); 4, R. S. A. Harvey (Salisbury). Platies: 1, G. P. Carter (Weymouth); 2, A. Nicholls (Yeovil); 3, P. A. Cairns (Runnymede); 4, S. Cook (Salisbury). Mollies: 1, M. Sainsbury (Salisbury); 2 and 3, A. Nicholls (Yeovil); 4, B. Poole (Bournemouth). Characins, Hemigrammus and Hyphessobrycon only: 1, E. Cox (Bournemouth); 2, M. Sainsbury (Salisbury); 3, S. A. Garcia (Bournemouth); 4, R. G. Pike (Bournemouth). A.O.V. Characin: 1 and 4, E. Cox (Bournemouth); 2, J. V. Jeffery (Bournemouth); 3, I. Goddard (Salisbury). Angels: 1, D. W. Eason (Weymouth); 2, K. R. Forward; 3, A. J. Ryan (Bournemouth); 4, S. A. Garcia (Bournemouth). A.O.V. Cichlids: 1, R. K. Willey (Salisbury); 2, S. A. Garcia (Bournemouth); 3, J. Scott-Morgan (Bournemouth); 4, J. V. Jeffery (Bournemouth). Barbs: 1, R. J. Brown (Salisbury); 2, I. Goddard (Salisbury); 3, B. Coombes (Bournemouth); 4, J. Stark (Bournemouth). Egg-laying Toothcarp: 1 and 2, H. Armitage (Portsmouth); 3, R. S. A. Harvey (Salisbury); 4, P. Brown (Bristol). Fighters: 1, J. V. Jeffery (Bournemouth); 2, A. M. Disney; 3, S. A. Garcia (Bournemouth); 4, K. Brown (Bristol). A.O.V. Labyrinths: 1, P. A. Grosvenor (Runnymede); 2 and 4, S. Cook (Salisbury); 3, P. McFarlane (Bournemouth). Danios, Rasboras, Minnows: 1, D. P. Harding (New Forest); 2, S. Cook (Salisbury); 5, R. Hemming (Bristol); 4, R. J. Brown (Salisbury). Catfish and Loaches: 1 and 3, P. Brown (Bristol); 2, R. G. Pike (Bournemouth); 4, B. Coombes (Bournemouth). A.O.V. Tropical: 1, R. J. Brown (Salisbury); 2, K. C. Smith (Runnymede); 3, S. A. Garcia (Bournemouth); 4, C. W. Eason (Weymouth). Breeders, Egg-layers: 1, T. H. Haston (Weymouth); 2, Mrs. T. Gillard (Yeovil); 3, P. Brown (Bristol); 4, C. W. Eason (Weymouth). Breeders, Livebearers: 1 and 4, G. P. Carter (Weymouth); 2, C. Beets; 3, T. J. Croucher (Brighton). Breeders, Coldwater: 1, V. Collins (Yeovil); 2 and 3, J. V. Jeffery (Bournemouth); Common Goldfish: 1, 2 and 3, J. V. Jeffery (Bournemouth); 4, Mrs. T. Gillard (Yeovil). A.V. Shubunkins: 1, I. Chaney (Bournemouth); 2, B. Watkins (Bournemouth). Twinnails: 1 and 2, V. Collins (Yeovil); A.O.V. Coldwater: 1 and 2, V. Collins (Yeovil); 3, S. Collard (Bournemouth); 4, V. B. Hunt (Portsmouth). Best in show: R. K. Willey (Salisbury) 85 pts. Best Tropical in show: R. K. Willey (Salisbury) 85 pts. Best Coldwater fish in show: V. Collins (Yeovil) 89 pts.

THE Hounslow and District A.S. are looking forward with great anticipation to their Annual Open Show. This is being held this year on 14th September, at the Youth Centre, Cecil Road, Hounslow, and this venue is a great improvement on others previously used. It is hoped that last year's record of 600 entries will be beaten.

Recent table show results are as follows: Pairs: 1, J. Thorne (Cherry Barbs); 2, John Thorne (Guppies). Furnished 4 in. by 4 in. Jars: 1, B. Abbot; 2, Mr. Stone. Lectures and talks at the society's regular meetings have been

very interesting, and subjects have included "Fish foods and feeding," and "Diseases of fishes." New members and visitors are always welcome at the regular meetings held every other Wednesday at Isleworth Community, Clifton Road, Isleworth, Middlesex, or details can be obtained from the secretary, Mr. Derek Woodward, of 34 Uxbridge Road, Hanworth, Middlesex.

AT the July meeting of the Leek and District A.S. members and newcomers were shown a slide lecture with taped commentary entitled "Livefoods." This, besides discussing the home cultivation and use in the aquarium of the popular livefoods—daphnia, shrimp, tubifex, infusoria and other less well known types, also dealt in some detail with the natural history of each species, of great interest to the more scientific minded members present. The chairman, Mr. Ash, again voiced the society's thanks to Mr. Clowes for the loan of projector, screen and tape recorder.

The members' show for the "Pairs and Livebearers" class again resulted in some excellent fish being presented, and pointing was high. The placings were: 1, S. Ormerod; 2, and 4, W. Ash, and 3, R. Billing.

THE July meeting of the Horsforth A.S. was extremely well attended despite a wet evening. The monthly table show resulted as follows: Specified Class: 1, M. Pollard; 2, M. Barker; 3, A. Jobbins. A.O.V.: 1 and 2, W. Audley; 3, K. Shaw. Juniors: 1 and 2, D. Shaw; 3, S. Ilstuh.

AT the Bournemouth Show, V. Collins of the Yeovil A.S. was successful in the coldwater section, winning the best coldwater award with a Rudd. Other awards included three Best Fish in the Show, 1 and 2 with twin tails, and 1 and 2 with A.O.V. Coldwater, and first in the Coldwater Breeders. Other prize-winning members included Mrs. Gillard, second Breeders Egg-layers, and fourth Goldfish; A. Nicholls second and third Mollies, and third in the Platies.

AT the inter club meeting between the Weston-super-Mare and Yeovil Societies a fish show resulted in Weston winning by 84 points to 53. The Yeovil club winners were as follows: Second in the Barbs, N. Stainer; F. Pilton, 1 and 2 Swordtails; A. Nicholls, 1 Platies. Best fish in show: Mrs. Bushell, Black Mollie; H. Wooding, 1 Male Fighters; Breeders Livebearers: N. Stainer, second.

DESPITE being unfortunate in getting a guest speaker the July meeting of the Tonbridge and District A.S. was quite successful. There was a good entry for the table show which was for A.V. Tetra, and the winners were: 1, C. Brunning; 2, T. D. Amos; 3, J. J. Amos; 4, K. Mitchell. During the evening two new members were enrolled. New members are always welcome at the meetings in Dowgate Hall at 8 p.m. on the second Wednesday in each month. In the first attempt at exhibiting at an open show the society were surprised to have four award winners. Mrs. I. Bellingham had a first with a Labeo bicolor, J. Bellingham a second with a Spanner Barb, and I. Mathieson collected a third with a Fantail Guppy; he also had a fourth with a Nanostomus anomalus. New members are welcome at meetings in Dowgate Hall at 8 p.m. on the second Wednesday of the month.

AT the latest meeting of the Warrington A.S. a large number of aquarists were given a slide show by V. Hill and a taped lecture on various plants used in the aquarium, with a discussion on various topics following. The chairman, R. Tench, announced that plans for the open show on 8th September were almost complete, and the president, A. Higham, presented the "Fish of the Month" trophy to P. Norris, and second and third cards to A. Addison. The social sub-committee organised a coach trip to see Marineland and Oceanarium and Aquariums at Morecambe, where everyone spent a most enjoyable day.

At an earlier meeting, V. Parrington gave a most interesting talk and slide show on Guppies, also building a fishhouse. The results of the "Fish of the Month" competition were: Large Barbs: 1 and 3, R. Tench; 2, Mr. Massey. Small Barbs: 1 and 2, P. Norris; 3, Mr. Baker. Although there is a steady influx of new members and the club continues to expand there is still room for a few more members. Anyone requiring information and details should contact A. Addison, secretary, 5 Hewitt Street, Latchford, Warrington, Lancs.

THE annual show results of the South Wales Section of the P.G.B.S. were as follows:—Three Gold Jewel awards and three Silver Pins were awarded. P. Gunner, of Cardiff, a new member to the South Wales Section was awarded Best South Wales Exhibit and Best in Show, and he also won his first Silver Pin. J. Martin Memorial Cup (Best in Show), P. Gunner; Best South Wales exhibit, P. Gunner; Best Female, M. Delingpole; Best Breeders Team, J. Wheeler; Best South Wales Breeders Team, P. Player; South Wales Points Cup, R. Wigg. Coppertail Males: 1, K. Pearce. Round Spear and Pintail Males: 1, M. Delingpole. Scarf-tail Male: 1, F. Hall. Original Veiltail Male: 1, R. Wigg. Bottom Sword Male: 1, Mrs. D. Court. Double Sword Male: 1, M. Delingpole. Pannal Male: 1, M. Delingpole. Lyre-tail and Top-sword Male: 1, J. Wheeler. Delistail Male: 1, J. Wheeler. Long Dorsal Veiltail Male: 1, P. Gunner. Short Dorsal Veiltail Male: 1, R. Clarke. Flagtail Male: 1, P. Hall. Metropolitan Female: 1, F. Hall. Super-tail Female: 1, P. Player. Scalloped-tail Female: 1, Mrs. D. Court. Grey Females: 1, Mrs. D. Court. Coloured Female: 1, M. Delingpole. Gold Female: 1, J. Wheeler. Gold-faded Female: 1, M. Delingpole. Wedge-tail Female: 1, P. Player. Breeders Male: 1, J. Wheeler. Breeders Female: 1, Mrs. D. Court. Non-members Males: 1, P. Parsons. Non-members Females: 1, P. Parsons.

THE first meeting in July of the Mid Herts. A.S. was taken up by lectures given by the chairman, T. Timms on D.L.Y. tank construction, and by P. Bird on pond life, friends and enemies to the aquarist. A table show for live beavers was held at St. Albans for the second meeting of the month. The results were as follows: A.O.V. Livebearers: 1, G. Ralph. Platies: 1 and 4, B. Rumney; 2, D. V. Lander; 3, G. Ralph. Mollies: 1 and 4, C. Withers; 2 and 3, T. Summers. Swordtails: 1 and 3, I. Willis; 2, T. Timms; 4, T. Parker. Best fish in show was a Swordtail owned by I. Willis. The judge was K. Nutt of Tottenham.

AT the Biford and District Aquarist and Pondkeepers' Society July meeting a Crisis Cross Quiz was held, providing members with an opportunity to increase their fishkeeping knowledge and at the same time creating a good deal of amusement. The results of the table show for the following three classes of fish were as follows: A.V. Barb: 1, D. Seaman (Nigger Barb); 2, Mr. Robinson (Tiger Barb); 3, Mr. Summers (Ticto Barb). A.V. Mollie: 1, S. Van Cliff (Black Mollie). A.V. Single Tail Pond Fish: 1, W. Rowe (Golden Orfe); 2, D. Woodley (Golden Orfe). The society's annual pond competition took place on Sunday, 7th July, and an interesting commentary on the entries was given by the president, Vic Price. The winners were: 1, P. Woodley; 2, L. Smith; 3, B. Bird; 4, P. Hartley.

Officers elected at the annual general meeting held on the 10th June are as follows: President, V. Price; vice-presidents, J. Nutt, L. Jarvis, M. Braham; chairman, A. L. Stebbing; vice-chairman, J. A. Sanders; treasurer, M. Brill; asst. treasurer, L. Smith; secretary, R. Ruth; asst. secretary, D. Woodley; show secretary, H. Berger; asst. show secretary, D. Woodley; press secretary, L. Smith; librarian, K. Ellis; committee members, Mrs. V. Woodley and Mrs. K. Ruth; auditors, J. Hazam and G. Irish. At the Dagenham town show the society entered two furnished aquaria, being placed 1st (coldwater) and 3rd (tropical). Once again H. Berger's lionhead won the award for the best coldwater fish in the show.

AT a recent meeting of Swillington A.S. the table show, Breeders Livebearers, was won by Mrs. S. Batty, who received the Clive Mills Trophy. Second and third were Mr. and Mrs. Stringer. Recent entertainments at the meetings have been an excellent tape and slide show supplied by the British Killifish Society, a quiz formulated by one of Swillington's own members, and some coloured slides of the Furnished Aquarium exhibition at Bradford, in which some of the members were placed—Mr. Binks, first; and Mrs. Stringer, sixth.

Results of Swillington A.S. third open show were as follows: Mollies: 1, J. and H. Dornie; 2, P. Iveson; 3, R. Wrenswell. Platies: 1, Mr. and Mrs. Cohen (section winners); 2, Mrs. S. Batty; 3, Miss B. Kaye. Swordtails: 1, P. Barrett; 2, T. Douglas; 3, Mr. Wright. Guppies: 1, P. Reynolds (section winner); 2, G. Monk; 3, D. W. Smith. Small Barbs: 1, J. and H. Dornie (section winners); 2, P. Buxton; 3, Mr. and Mrs. Burnap. Large Barbs: 1, R. Taylor; 2, J. Whitley; 3, G. Poole. Small Characins: 1 and 2, A. G. Esteves; 3, R. Walker. Large Characins: 1, Mr. Turner (section winner); 2, Mr. White; 3, J. and H. Dornie. Dwarf Cichlids: 1, R. Walker; 2, J. Chamberlain; 3, J. and H. Dornie. Large Cichlids: 1, P. Carey (section winner); 2, R. Taylor; 3, K. Scothorn. Corydoras Cats: 1, A. G. Esteves; 2, R. Walker; 3, Mrs. I. Bullyment. A.O.V. Cats and Loach: 1, J. and H. Dornie (section winners); 2, P. Carey; 3, R. Walker. Rabbits, Danios and Minnows: 1, Mr. and Mrs. Cohen (section winners); 2, P. Reynolds; 3, F. E. Gregory. Sharks and Fox: 1, R. Walker (section winner); 2, F. Gates; 3, A. G. Esteves. Fighters: 1, A. E. Whitlock (section winner); 2, A. Smith; 3, D. W. Smith. Anabantids: 1, A. E. Whitlock (section winner); 2 and 3, J. and H. Dornie. Toothcarps: 1, Mrs. I. Bullyment (section winner); 2, A. Greenhall; 3, D. Jackson. Pairs Livebearers: 1, J. and H. Dornie (section winners); 2, Mrs. A. Cawthorne; 3, Mr. and Mrs. Stringer. Pairs Egg-layers: 1, J. and H. Dornie (section winners); 2, R. Walker; 3, Mrs. S. Batty. Breeders Livebearers: 1, Mr. and Mrs. Burnap (section winners); 2, J. and H. Dornie; 3, Mrs. S. Batty. Breeders Egg-layers: 1, J. and H. Dornie (section winners); 2, Mrs. I. Bullyment; 3, R. Walker. A.O.V. Tropical: 1, P. Carey (section winner); 2, P. Reynolds; 3, A. Deakin. Goldwater: 1, E. D. Hunt (section winner); 2 and 3, Mr. Edon. Furnished jars: 1 and 2, Mrs. S. Batty; 3, Mr. Naylor. Best in show: Mr. Turner of Mixenden with a Blind Cave Tetra.

THE Blackwater A.S. sent a team to the Medway show to try their luck with a furnished tank, after much hard work, mostly done by the chairman, Mr. Iddie Gee. Efforts were rewarded by a first prize and as this was the B.A.S. first attempt it is hoped to add to this trophy in the future. Besides taking a few minor cards home with them the club members were overjoyed to see the chairman and his wife take home the first and second prizes in the raffle. At the last club meeting a quiz show and discussion were held, and these were fully enjoyed by all. Table show results: Whiteclouds and Danson: 1, G. Yellow; 2, Mr. and Mrs. E. Gee; 3, M. Fuller. Any local aquarist who is interested please write to the secretary, Mr. D. G. Kempen, 47 Hall Estate, Goldfinger, Maldon, Essex, or attend at the Hayleigh Oak at 8 p.m. on the third Wednesday of the month.

NEW SOCIETY

THE West Cumberland A.C. was started recently. The meetings are held at the Whitehaven Y.M.C.A. and further details may be obtained from L. Sparks, secretary, 34 Sneffell Terrace, Seaside, Whitehaven.

SECRETARY CHANGE

Reigate and Redhill A.S.: Mrs. M. Young, 36 Ashdown Road, Reigate, Surrey.

CHANGE OF DATE

THE Reigate and Redhill A.S. have found it necessary to change the date of this year's Open Show to Sunday, 22nd September.

AQUARIST CALENDAR

- 7th September:** High Wycombe A.S.
- 7th September:** Yate and District A.S. Annual Open Show at Christchurch School, North Street, Downend, Bristol. Schedules from Mr. T. J. Green, 42A, North Street, Downend, Bristol.
- 7th September:** Bethnal Green A.S. Annual Open Show at the Bethnal Green Evening Institute. More details will be available later.
- 7th-8th September:** Nottingham and District Open Show, Drill Hall, Triumph Road, Nottingham.
- 8th September:** Warrington A.S. First Open Show, St. Benedict's Youth Club (Bell Hall), Orford Lane, Warrington. Show schedules from Mr. Hipham. Tel.: Warrington 36939.
- 14th September:** Hounslow and District A.S. Annual Open Show at the Youth Centre, Cecil Road, Hounslow.
- 14th September:** Nuneaton A.S. First Open Show. Schedules and details from Show Secretary, G. E. Cox, 36, Manor Court Road, Nuneaton, Warwickshire.
- 21st September:** Amersham and District A.S. Annual Open Show. Secretary, Mrs. Veronica Keating, 62, Townsend Road, Chesham, Bucks.
- 21st September:** Newport A.S. Sixth Annual Open Show at the Duffryn Junior High School, Snow Hill, Newport. Details from the show secretary, Mr. M. J. Parry, 45, Western Drive, Gwalba, Cardiff.
- 21st September:** Mid-Herts A.S. Open Show at St. Paul's Church Hall, St. Albans, Herts. Show schedules are available from C. Withers, 15, Charnmouth Road, St. Albans, Herts.
- 22nd September:** Reigate and Redhill A.S. Annual Open Show, Somers Hall, Reigate. Show Secretary, Mr. I. Stamp, 10, Bensham Drive, Horley.
- 22nd September:** Stone A.S. Open Show. Schedules may be obtained from Show Secretary, K. Harvey, 61, St. Vincents Road, Walton, Stone, Staffs.
- 22nd September:** Birmingham Section F.G.A. Open Show at Glebe Farm Community Centre, Glebe Farm Road, Stechford, Birmingham 33. Show Secretary, Mr. P. W. Jinks, 355, Stockfield Road, Yardley, Birmingham.
- 22nd September:** Dewsbury and District A.S. Annual Open Show, Further Education Centre, Park Road, Batley.
- 27th and 28th September:** Bristol A.S. Annual Open Show at Bishopston Parish Hall, Gloucester Road, Bristol. The Show Secretary is R. Berry, 120, Fouracres Crescent, Downend, Bristol.
- 29th September:** Annual Open Show at Harrods, Sclarium, South Promenade, Hackney.
- 29th September:** Hucknall and Bulwell A.S. Annual Open Show. Works Centre, A. R. Marshall and Sons Ltd., Forest House, Hucknall Lane, Bulwell, Notts. Show schedules from M. T. Harrington, 5, Greenwood Vale, Hucknall.
- 6th October:** Heywood and District A.S. Second Open Show at St. John's Ambulance Hall, Bamford Road, Heywood, Lancs. Details from Mr. K. Hill, 29 Chadwick Lane, Heywood, Lancs.
- 12th October:** Cheltenham and District A.S. Annual Open Show, Ambulance Headquarters Hall, 36, Gloucester Road, Cheltenham.
- 17th, 18th, 19th October:** Scottish A.S. Annual Open Show, McLellan Galleries, Sauchiehall Street, Glasgow.
- 26th-27th October:** British Aquarists' Festival Belle Vue, Manchester.
- 3rd November:** N.E.L.A.S. Annual Open Show in the National Engineering Laboratory, East Kilbride.
- 10th November:** Halifax A.S. Annual Open Show, Smith Bulmer & Co. Ltd., Holmfield Mills, Halifax. Schedules from A. G. Whyte, 11 Rothwell Drive, Halifax.
- 10th November:** Hartlepool A.S. Annual Open Show at Longcar Hall. Schedules available from J. D. Watson, 42 Sydenham Road, Hartlepool, Co. Durham.
- 1st December:** Airedale and District A.S. 7th Annual Open Show, The Town Hall, Guisley, Nr. Leeds, Yorkshire. Schedules and details available from the show organiser and secretary: Mr. G. E. Walker, 2 West End Terrace, Guisley, Nr. Leeds, Yorkshire.