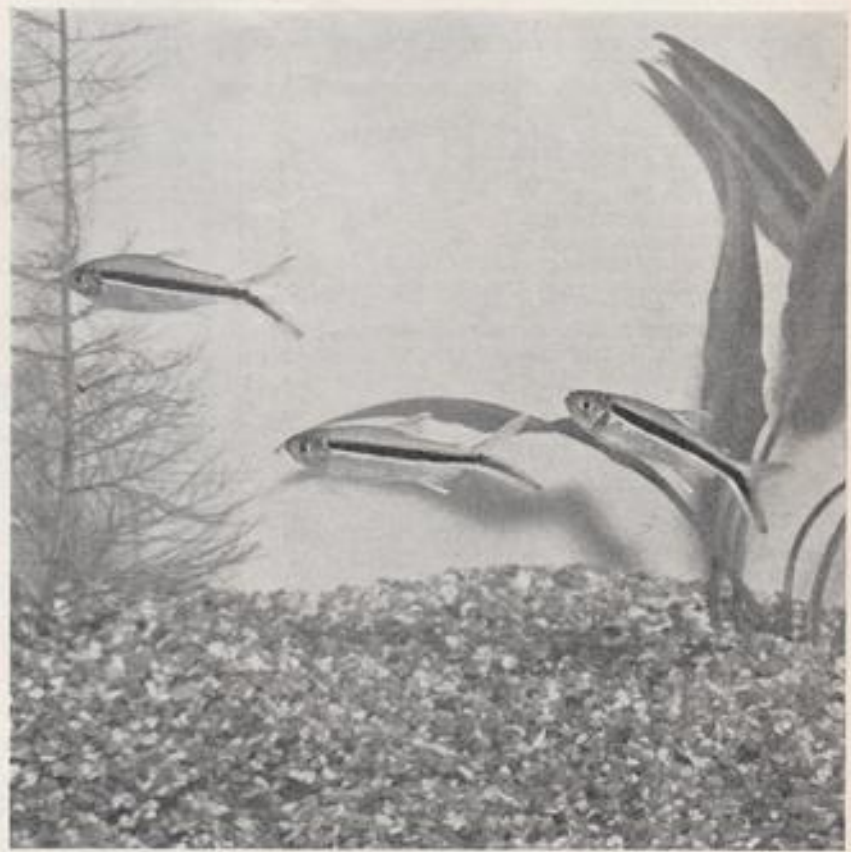


The Aquarist

and Pondkeeper

NOVEMBER 1964



MONTHLY
Vol. XXIX No. 8

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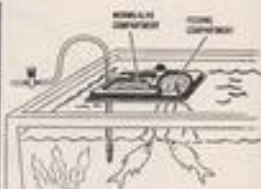
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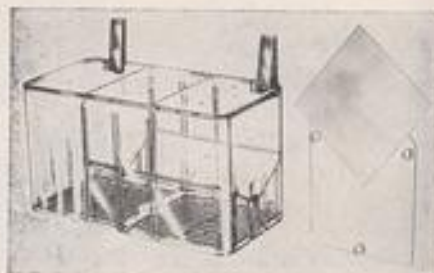
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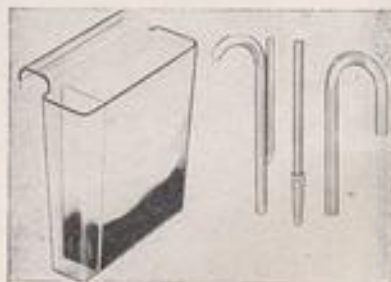
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Heniochus acuminatus (Linne)

Chaetodontidae
Subf: Chaetodontinae
Tribe: Heniochini



Synonyms: *Chaetodon acuminatus* LINNE, 1758 (272); *Chaetodon macrolepidotus* LINNE, 1758 (274); *Chaetodon bifasciatus* SHAW, 1803; *Heniochus macrolepidotus* CUVIER and VALENCIENNES, 1831.

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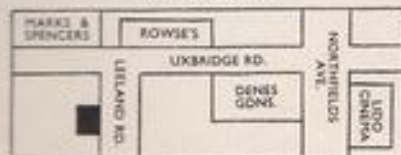
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Founded in 1924 as "The Amateur Aquarist"



VOL. XXIX No. 8

1964

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Glazing an Aquarium

by B. FRY

TO glaze an aquarium frame you need a strongly adhering, water-resistant, yet elastic cement, and the alternative to buying one ready mixed from your dealer is to make your own.

There are recipes galore to be found in the literature of our hobby, from plain glazier's putty which, for small tanks, is as good as any, to messy mixtures of liquid pitch and gutta-percha applied warm from a heated iron ladle.

For tanks measuring 24 in. by 12 in. by 12 in. or larger a perfectly satisfactory cement can be made from ordinary whiting putty softened by a few drops of boiled linseed oil or gold size, and then brought back to its original fairly stiff consistency by the addition of dry red lead. This must be painstakingly kneaded into the putty until it assumes a uniform pink hue. A dessertspoonful of red lead powder is about right for 2½-3 lb. of putty, which is the quantity required to insert the five pieces of glass in a 2 ft. frame.

Most failures in glazing a frame are due, it seems, to faulty spreading of the cement, and badly fitting panels of glass. With regard to the former, the pressed-down sausages of cement must form a continuous ribbon right round the inside sections of the frame. If the joints in the cement are not overlapped, and then fused together properly, air-pockets will be left into which, when the aquarium is filled, water will seep, and sooner or later burst through the thin walls of cement to the outside of the frame. But water cannot penetrate a solid, oil-based cement pressed tight against the frame by the weight of the water inside the tank.

As a rough guide, each rolled length of cement, when it is laid on the frame, should be a little over ¼ inch thick. After the glass has been placed on this bed, and firmly pressed into position, the cement squeezed out along the margins should be trimmed off with a razor blade. The glass panels themselves should be cut to fit so closely that there are no wide expanses of cement left exposed to soften under habitual contact with water and fall away. Another point worth remembering is to fill the tank immediately after glazing to force the glass panels well into the sides of the frame. Then, after emptying with a siphon tube, paint all along the dried outside edges of the cement with a quick-drying paint and allow to dry before filling again for the final 3 or 4 days' soaking.



A New Species:

Barbus orphoides

by

JACK HEMS

WHETHER or no this comparatively new introduction from south-east Asia will ever become a popular species is a matter for some speculation. It has one great disadvantage shared by a few other handsomely appared yet little sought-after barbs: it grows to a considerable size. Fortunately for the tropical aquarist life in the aquarium tends to stunt its growth, but, even so, it will probably exceed 6 inches in a roomy, well aerated tank, which is roughly half the length it can reach in the wild.

Be that as it may, young specimens add much in the way of sparkle and lively movement to the ordinary community collection, but as soon as they begin to outgrow their companions they should be given a tank to themselves, or, alternatively, moved to more spacious quarters already tenanted, perhaps, with peaceful species which may grow as embarrassingly large as themselves.

In general appearance *B. orphoides* is greyish olive on the back shading down to leaden silver reflecting metallic green and blue on the middle and lower sides. The scales

are large with grey shadings that produce a horizontal lined effect. There is a dark spot just below the anterior base of the dorsal fin, and another in the root of the tail. The fins are tinged or richly flushed with red. The forked caudal fin is particularly attractive because the edges of the lobes are sometimes broadly outlined with grey to black. There is a red blotch in the gill-covers, and a red top to the iris of the lustrous black eye. A pair of maxillary barbels droop wistfully from the corners of the mouth.

Like most other barbs we know, *B. orphoides* will swim in all levels of the water, though it is to be found most frequently near the bottom. It has an enormous appetite for all sorts of live, fresh and dried food. It also has a liking for green food, and the aquarist must not expect adults to show much, if any, respect for the tenderer species of submerged vegetation. The regular range of temperature for tropical species, that is to say, 72°F (22°C) to 78°F (26°C), suits it very well. The external sex distinctions, if any, are not known, and up to the present writing the species, it seems, has not bred in captivity.

The Aquarium "Earth"

THE phrase "earth the frame to be on the safe side" is not, as I aim to show, always necessarily true.

In the usual watertight aquarium the angle-iron frame does not contact the water; that is, the resistance between the two is very high, due of course to the paint, putty and glass. All the above phrase will guarantee is that to touch the metal frame only would be safe, which is quite true, but unfortunately the usual glass-tubed heater is far removed from anywhere near the frame; in other words, we are earthing remote from the electrical appliance.

If a heater fractured and water seeped on to the live side of the heater element causing a connection to the volume of water in the tank (this is not an impossible situation), under this condition there would be a voltage between the water and any earth, for example the earthed frame. In this case the earthed frame is of no use as any fuse in the live side of the mains would not experience any increase in current and therefore would not blow, and so the installation constitutes a considerable danger. If now we earth a metal strip and insert it into the water the "live" and earth current will increase. The amount by which it increases will depend on the chemistry of the water and the nearness of the metal to the element; the aim is to increase it so much that the fuse blows and so renders the installation harmless.

Another example of this situation is one where the plastic of the flex to the appliance cracks and allows water to contact the bare wire; again the water could be "live" and anyone touching the earthed frame and water would receive mains or near mains voltage. Not earthing the frame and standing on the normal wooden floor would be less dangerous.

As stated before, the aim, if a fault occurs, is to blow the fuse and therefore disconnect the mains. Now this can best be achieved by providing as low a resistance as possible between the earth and any part of the appliance which can become "live" and therefore dangerous to use. This ensures that maximum current will flow and greatly increases the chance of the fuse blowing. With a glass type heater this cannot become "live" but the water around it can, therefore we must locate the earth where the resistance is least between it and the element, in other words as close to the glass tube as is possible. The ideal would be a metal braid running the length and covering the flex, and a metal sheath around the heater, both of course earthed.

Now let us consider a tank which leaks, and in which there is contact between metal frame and water. If the fault is one of those mentioned above, then earth current

Please turn to page 147

Photographing Aquaria



This photograph of a pike in an aquarium at Chester Zoo was taken by the author on Ilford FP3 film, exposure 1 sec. at $f/4$

by BRIAN W. BURNETT

MANY people who have fishes or other water life in aquaria miss a great deal by not photographing their charges. Most pond-living animals have short life expectancies, compared with human beings, and it is often useful and interesting to keep a permanent record of the animals and fishes which you have had in the past. If any of these were prize-winners, there is always the possibility that your photographs could be framed and hung on the wall of your home, or you may even be able to sell the occasional picture to the press when one of your fishes wins a competition.

Aquarium photography is not difficult, but it requires some care. There are several problems which you must overcome, but each of these will become less troublesome as you gain experience.

Most fish and other water creatures are fairly small—too small to be photographed successfully with a camera alone. Fortunately, close-up lenses are inexpensive (about 12s. each) and will allow you to photograph anything down to the size of large tadpoles. As far as cameras are concerned, practically any will be suitable for this type of photography, but box cameras cannot be used as they will not focus close enough.

A close-up lens fits on to the front of your normal camera lens and reduces the focusing distance. There are three main types of close-up lenses. A no. 1 lens gives you a focusing range of 19 inches to 40 inches—provided that your camera lens normally has a focusing range of about 3 feet to infinity. A no. 2 lens gives a range of 13 inches to 19 inches, and a no. 3 lens gives a range of 9½ inches to 13 inches.

Buy a no. 1 lens for general views of fish tanks, including several of the occupants. Buy a no. 2 lens for larger fishes and amphibians. Use a no. 3 lens for smaller fishes, small lizards, frogs and toads. For smaller creatures, special equipment is necessary.

The next problem which you encounter is that of reflections on the glass sides of the tank. There are two ways of reducing these. The best way is to take the pictures with the lens of the camera pressed against the glass. This is often impractical, however, and the alternative method is more commonly used. Switch off all of the room lights (or close the curtains if it is light outside) and just use a light above the tank as the "studio" light. Position the camera slightly above the subject position so that it is pointing slightly downwards, and cover the tripod legs—a tripod is essential—with a sheet of black cloth.

While we are on the subject of tripods, make sure that your tripod is firm enough to keep your camera perfectly still. An ex-Government tripod, costing a couple of pounds, made of wood, is much better than the flimsy metal tripods which seem to be so popular these days.

Unless you have a co-operative subject which will stay perfectly still for a long period, you must devise some method of restricting its movement so that you can focus on a predetermined point where it will eventually have to pass. The best method for doing this with fishes and other swimming creatures is to place a sheet of glass, about the same size as the side of the tank, in the tank a few inches away from, but parallel to, the side. Put your subject into this enclosed space and focus on a point half way

between the sheets of glass. Now you must wait until the subject comes into position, when you can fire the shutter.

The lighting inside aquaria and in houses is usually very poor for photography, therefore you must artificially boost the brightness. A couple of 100 watt lamps above the tank will be bright enough. Load your camera with a medium speed film, such as Kodak Verichrome Pan or Ilford FP 3 and position the lights about 3 feet above your subject. With this arrangement you will be able to use the camera settings of 1/30 sec. at f4.5. If your camera has a maximum lens aperture of 8, load your camera with a high-speed film, such as Ilford HPS or Kodak Tri-X and use a shutter speed of 1/30 sec.

When taking close-up pictures it is most important to focus perfectly accurately. The slightest error will result in blurred pictures. Measure out the focusing distance with a tape measure; do not try to guess, and always use your camera on a tripod. For fairly slow-moving underwater creatures, a shutter speed of 1/30 sec. should be quite sufficient, but for faster fishes you must use higher

shutter speeds, in which case an even faster film or brighter lights will be necessary.

When photographing lizards or amphibians, it is often possible to keep them still by placing them on a tray of sand over which an electric light bulb is shining. The warmth of the light will usually persuade the animal to lie still for a while.

It is always best to take pictures of lizards, and other long thin creatures, from a side-on position. If you take the pictures with the head towards you, the tail will be out of focus. By taking the photograph so that the animal's head, body and tail are all about the same distance away from the camera, it is an easy matter to have the whole of it in focus.

A photo album showing the past and present inhabitants of your aquarium will be a source of pleasure and interest to your fellow aquarists, so keep an album of all your fish and label them clearly with all the details which you think are relevant—length of life, size, prizes, date of birth and name. You never know, you may be called upon to produce a picture of one of your prize-winners for the press one day!

Book Review

Tropical Aquarium Fish, their Habits and Breeding Behaviour by A. van den Nieuwenhuizen. Illustrations in black and white and colour. Constable & Co. Ltd., London. 90s.

As indicated by the title, this is a book devoted to the behaviour of aquarium fishes, and though the number of species dealt with is small (41 with passing mention of about as many again), their habits are described in great detail. This facet of the hobby is very interesting, and the author has shown that he is an experienced aquarist, a keen observer of detail and really loves his fish. Those who have tried to photograph fishes will appreciate that it takes an excellent photographer with infinite patience to obtain action photographs of spawning. The author obviously possesses this patience as the spawning sequences shown in this book are of the highest quality.

Would-be breeders will be disappointed at the lack of technical data such as temperature, pH, water hardness etc., which are not mentioned at all in many cases, and when the information is present it seems to be hidden in the discussion and needs searching for. The production of this book is wonderful; the quality of the paper and the printing are of the highest standard. The larger size of the pages reduces the thickness of the book, making handling very easy in comparison with the majority of aquarium books. The 42 coloured plates are nearly all of exhibition-quality fishes, a very unusual feature, and though some pictures are familiar most are new to me. This book will certainly be a great favourite in public libraries, and for the aquarist and naturalist alike, makes very fascinating reading.

J. E. Shore

The Green Turtle and Man by James J. Parsons. 126 pages. Illustrated. University of Florida Press. 58s.

IN *The Green Turtle and Man* Dr. Parsons traces a fascinating story. The green turtle (*Chelone mydas*) is a large, inoffensive reptile at home in tropical oceans, where it grazes on certain types of seaweed. Turtles are a conservative group of ancient reptiles which have remained

almost unchanged over hundreds of millions of years. Once turtles reach medium size they have few, if any, serious predators apart from man. Mortality takes place when predators, which include monitor lizards (*Varanus*) and wild pigs, dig up nests and eat the eggs, and when the hatching turtles leave the nest to scurry over the sand to the sea. The first few hours of life away from the nest are fraught with dangers. Most of the baby turtles fall prey to sea birds while still on land, or are eaten by sharks and other predaceous fishes soon after they enter the sea. However, green turtles lay large numbers of eggs—up to 100 or more at a time, and six or more clutches in a single season. They then spend 2 or 3 years at sea before returning to a tropical beach to lay again. Turtles are well able to maintain themselves against natural hazards but, in the face of commercial exploitation, they have slowly decreased in numbers. As Dr. Parsons writes: "The pastures of vegetation that stretch over endless miles of tropical ocean floor and that once supported countless green turtles are now almost empty. Only recently have people come to realise that *Chelone mydas* was rapidly approaching extinction and that strenuous protective measures must be taken." If the green turtle survives, much of the credit will be due to Archie Carr in Florida and Tom Harrison in Sarawak (Malaysia). Dr. Parsons discusses the future of the green turtle against a detailed account of its past history. He writes of its use by primitive man as a necessity, of its recent exploitation as a luxury, and traces present-day methods aimed at its conservation. Valuable sections of this interesting book are the survey of its nesting beaches throughout the tropics and the extensive bibliography. For those who wish to find out more about these absorbing marine reptiles *The Green Turtle and Man* can be strongly recommended as a readable and carefully documented account.

H. Robert Bustard

Freshwater Fishes of the World by Günther Sterba. Translation by Dr. D. W. Tucker. Vista Books, London. 84s.

SINCE the preparation of the review of this book that appeared in the October issue of *The Aquarist* we have received a copy of the second impression, which is likely to be the one now on sale. There have been no changes in the text but the publishers have had to increase the price; the new price is given above.

Cut Fish-Net—Sport of Japan

by FRANZ SPELMAN

WOULD you think of trying to catch fish with a net that has holes in it or is cut down the centre? Well, they do in Japan and it is a great sport, from what I have seen, at thousands of resorts throughout the country. One place I enjoyed most of all was in one of Yokohama's fine parks, about two minutes' walk from the world famous South Pier.

If you ever have the chance to visit Yokohama please do so. You will love it if you will take time out to watch the children as well as the adults engaged in this rare sport of catching fish with a net with a hole in it. The nets are carefully made of thin rice paper and deliberately slit so that the fish may easily elude its trapper. The skill and sport of the game comes from seeing how many fish one can catch in an allotted time according to the strict rules.

The participant is given a clean pan and a net, after paying a small fee, and turned loose among a variety of containers that hold various sizes of fish (the size also determines how much one pays and what category the prize will fall into). Often there is an attractive girl walking through the crowd selling the nets and the attractively painted pans to the eager sportsmen. The sheds where the fish boxes are kept are attractively decorated and arranged in unique patterns. Floating peacefully in the clean water are thousands of colourful fish that seem to know that no harm will come to them. The sportsmen sit high on a stool or some type of elevated seat, caring more about the fish than they do about the small fee that is paid to play the game. The fish breaks through the thin net more



Net in hand, a competitor receives her bowl ready for her catches



Children try the seemingly impossible task of transferring small moors from the trays to the bowls with a net that has been slit

than the players would like, and when the net, which has a hole in it from the start, is completely useless the fish have won. (If you take a look at the thin layer just on the inside of an eggshell you will get a good idea about how thin the net that is used to catch the fish is.) Nevertheless, men, women and children keep coming to play and some few walk away with a prize or choose to take the fish home to a waiting pond or container provided for its health and long life.

Skill or Chance?

This is not a game for anyone in a hurry. If the net is put into the water too fast or drawn out at the wrong angle it will disintegrate, or fall apart in unskilled hands. Some think that the game is mostly one of skill. Not skill in fish-catching, but skill in keeping a net from falling apart under the pressure of a small fish. Others say it is a test of "choice". One must constantly ask one's self, they say: "Must I go for a big fish and chance a hole in my net, or, should I seek out a small fish that I know will hit the net just right so as to be pulled out of the water before what I know will happen happens?" And then there are those with other ideas . . . "Perhaps it is stronger up around the

handle." "Is the lower end away from the middle tougher?" One can see people seemingly thinking such thoughts as the sport goes on.

Some players bet against one another. Some become disgusted and in shame try and try again until someone tells them how much determination and courage they have. Some children and women weep and wring their hands.

It seems to be a game where the player gets joy out of beating something with the odds against him or one that inflates his ego if he is lucky, as the hundreds of onlookers make flattering comments and praise his skill or what have you in the sport. Some come and take the temperature of the water and look at their watch and time a few nets before going into action. Sometimes this works, sometimes it does not. There would seem no sure way of beating the odds in the strange sport. Perhaps wits enter the game but in the end all one has is a dwindling net.

Near the top of the water seems to be where most of the fish are caught; perhaps the water pressure is less there. However, I have seen a net go deep into the water like a

fan cast into the sky and take several turns directed by the skilled player. A roar of delight goes up from the happy group playing and looking, when to the surprise of all a fish seemingly too large for the fan-like net comes out from his watery home. The player bows, accepts congratulations from the fishkeeper, selects his prize, gently replaces the fish in the water and disappears smiling at his accomplishment.

Some say the sport is a delicate art and to play it is to open up one's inner nature to the onlookers. See his delicate touch, he is sincere, his wits are perfect . . . These are only a few of the things one hears as the match goes on. The sportsman and the fish are equally skilled. I did not bring any fish away from the game but I will always remember the happy times I watched Japan's rare sport. The game gave me a fresh new view of man and his desire to be the master of all his environments, yet gentle, humane and kind. If you are ever in Yokohama, Japan, stop by South Pier and restore your faith in the innate goodness of mankind.

Christmas Presents for Aquarists

by B. WHITESIDE

CHRISTMAS time invariably brings with it the headache of what presents to buy for friends and relations. If, like yourself, any of your friends share aquarists' interests, the choice of what to buy is extended considerably. It is governed only by the extent of the finances available, but even for a moderate sum one can buy a variety of items which are sure to please any aquarist.

Knowing what to purchase is the main problem, but where friends are concerned, one has ample opportunity when visiting, to keep a wary eye open, and to drop a few pointed questions to see what sort of present would be appreciated. Any aquarist would be pleased to receive say, half a dozen tins of assorted fish foods. Most fish foods on the market to-day are of a high standard, and the recipient of several different varieties will be given ample opportunity to decide, by experience, which of these would be suitable to add permanently to his fish food menu.

Another suggestion could be several varieties of remedies for treating fish diseases such as white spot or fin rot. These are materials which one never knows when one will need, and having them at hand can be a great life-saver should trouble strike at an unexpected moment. One addition could be a packet of fertiliser tablets for aquarium plants. These would be of interest, especially to someone who has not tried them before.

A useful present for any aquarist would be one of the new aquarium cleaners, operated by a battery. These are rather expensive but if your money won't stretch that far, how about an external filter as a gift? Even if the aquarist has one already, an extra one is useful if several tanks are kept. There are several well-designed ones on the market now.

Anyone would be pleased to receive a weekly postal supply of live *Daphnia* or *Tubifex* worms, and some dealers arrange this. As an alternative, a culture of several types of worms—say micro, or white worms, would be a worthwhile gift. It's rather risky to order fish or snails for an aquarist, but a parcel of tropical or coldwater plants, where these would be needed, would be an excellent idea. For something rather more expensive a fibreglass pool would

add grace to any garden scene. The recipient would have the fun of planning the site during his Christmas holidays, and could order plants for the pool and its surroundings for spring delivery.

For the younger friend the present of a small aquarium could lead to an interest in the hobby of aquarium keeping, which could give a lot of pleasure throughout the person's life. A present of heater, thermostat and thermometer would be appropriate for the junior who would like to convert his coldwater set-up to a tropical one. A present of a pair of small terrapins would be of interest to the person who had the time and facilities for looking after them.

An addition to any aquarist's stock of equipment could be a hand lens. This useful item is often missed out. It can be used for examining parasites on fish, for looking at cuts or damaged fins, or just for getting a close-up look at any part of a fish. A reasonable hand lens can be bought for much less than 20s. It can also be used for examining pests on house plants, and if an aquarist shares this interest, a few house plants would be a useful present to decorate the fish house or on tank stands in the home. Suitable plants could include African violets, coleus, begonia rex, *Monstera deliciosa*, rubber plants or, perhaps, a cactus or two. Packets of seeds would also be appreciated if the aquarist has an interest in this method of plant raising.

Books are presents that most people like to receive, and a useful one could be one of the larger illustrated reference books on all aspects of fish-keeping. This will be a constant source of help and advice for even the most experienced aquarist. In the cheaper price range one can obtain a host of useful little books. Half a dozen of these would interest the beginner.

Few aquarists could fail to be pleased with a year's subscription to *The Aquarist*. This would be a present which would literally last for a year and which would keep beginner and expert alike in contact with the latest and freshest ideas on this absorbing hobby. Better check first, though, that he hasn't already ordered his own subscription.

Anostomus anostomus—a Breeder's Challenge

by Dr. R. O. B. LIST

Family: Anostomidae.

Habitat: Guiana and the Amazon basin from Mameo upwards.

Size: 5 in. (13 cm).

Temperature: 75°F (22° to 27°C).

I WOULD at the onset first remark on the size of 5 inches which I have given above. Specimens I have seen are not as large as this and have usually been about 2½ inches body size. Various correspondents are, however, adamant that 5 inches is the correct adult size and whilst I do not disagree with this I cannot vouch for it from personal experience.

This species does not have a popular name but its scientific name derives from the fact that it has a turned-up mouth. I also note that from a peculiar habit it has been referred to as the headstander. This is not at all correct, although it does tend to swim with the head down. The positioning of the fish with its head down is noticeable when it becomes excited, when it is hungry or has been shocked. Otherwise its position is quite normal.

It is an extremely handsome fish in every sense of the word, but does not lend itself to the displays to which we are accustomed, as it prefers sparsely planted aquaria and the tank bottom should be dark.

If transferred from a lightly planted aquarium with a dark bottom into a normally planted tank with light gravel, it will show evidence of shock, by swimming head down, and the brilliant colouring will diminish and remain diminished until the fish is replaced in the original tank. If the transfer takes place in a series of fairly rapid successions, its colouring will diminish almost as if you are using a dimming switch as used for theatrical purposes!

It is not recommended as a good community fish but those that I have seen tend to settle down rather easily.

This, however, may be due to the fact that not very many of them are seen and consequently it is rare to find more than one or two in any collection.

The body of *Anostomus* is cylindrical with the upper part of the head somewhat flat. It is also slightly toothed. The scales are large with the following scale counts: dorsal, 11 to 12; anal, 10; the lateral line has 40 to 43 scales.

In a sparsely planted aquarium it prefers *Cabomba*, *Ludwigia*, *Vallisneria*, *Heteranthera* and *Myriophyllum*. It is not a faddy feeder and will take live as well as dry foods. It does, however, eat algae and if these are not to hand will eat soft plants. Despite the turned-up mouth it prefers to take its food as a bottom feeder.

The glory of this species is in the striping, which goes the length of the body. A broad dark stripe runs from the mouth to the base of the caudal fin with another stripe above it and a further one below. These stripes can be dark green, brown or brown-black. In between the stripes the colour can be either ochre-yellow or red. The fish has an adipose fin, which should have a black edging, and the overall body colour is dark green on the back with a dull metallic gold sheen on the sides. The other fins are scarlet at the junctions with the body.

This species is not readily obtainable, and is consequently rather expensive. This is rather a pity as it will tend to keep this beautiful specimen as a rarity. All of my correspondents who have specimens state that they have been unable to breed them, and no one appears to have heard of anyone who has been successful in breeding them. Aquarists like to prove their mettle, and this may be a species that gives us something to think about. If anyone is successful I would be pleased to learn about it as well as to offer my congratulations, as this will be an event really worthy of commendation.

Leeches and other Pond Pests

by A. BOARDER

THERE are several creatures that may enter or live in the pond which may be pests, especially where small fishes are concerned. With the exception of the leeches these pests are generally too small to harm adult fishes or those at least 3 inches long. Those which are dangerous to small fry are the larvae of some of the dragonflies, water beetles and their larvae and water boatmen.

There are several leeches found in this country. One sometimes found on fishes in garden ponds is the horse leech (*Haemopsis sanguinifera*). A fully grown one can measure about an inch and a half when at rest but up to 6 inches when extended. Its colour is variable, depending on its surroundings, but usually is either brown or green.

The leech has a form of sucker at each end. The larger one is for anchoring to an object and the smaller one pierces its victim and sucks out its juices. A leech will hold on to its prey until it has swollen up with blood or juice to perhaps three times its size, when it releases its victim. This type is not the one used by physicians in olden times for blood-letting, which is *Hirudo medicinalis*.

It is not often that a leech attaches itself to a fish in the pond but if it does it can make a nasty wound even if it does not kill the fish. The leech has a secretion which it injects into its prey to stop the blood from coagulating, and this keeps the wound open for a long time. Leeches spend a lot of their time in the mud at the bottoms of the pond and



The great diving beetle (*Dytiscus*) and its larva (photograph at foot of column)

are often more active at night. They can be captured by using a torch at night at the sides of the pond or by leaving a piece of meat on a string in the pond at night. A wire covering should be made to prevent the fishes eating the meat. The string is lifted in the morning and any leeches caught can be killed. Most leeches lay their eggs in the mud at the pond-side, and not in the water.

Water boatmen are a type of water-bug and one of the commonest is *Notonecta glauca*. These can swim rapidly about in the water by means of oar-like paddles at their



Photo:

Laurence E. Perkins

sides. These "bugs" can attack and kill very small fishes and so they must be caught and killed when seen. These creatures have a kind of sharp beak with which they attack their prey and they can sometimes attack a fish larger than themselves. They can be caught with a net fairly easily as they have to come to the surface frequently to take in air. They rest at the surface in an upside-down position and have to keep swimming or hold on to something in order to remain below. They can be caught at night easier than by day when a torch shows them up plainly at the surface.

Pond-skaters (*Gerris*) are the creatures which move about on the surface of the water. They never enter it and so cannot be described as being of any danger to the fishes but they live on flies etc. which alight on the water. I have never seen any fish make an attempt to eat one of these insects.

The great diving beetle (*Dytiscus marginalis*) is quite a large creature, measuring up to an inch and a quarter long. Olive-brown in colour, with a yellow edge round the wing cases, they can fly quite strongly and may do so at night and so enter the garden pond unseen. They are quite ferocious and will attack anything living they can catch, including fishes. They can kill and eat a small fish and even a medium sized one is not safe from attack; considerable damage can be done. These beetles should be caught whenever seen as their larvae are even more deadly and ferocious. They are equipped with a pair of mandibles with which they can seize their prey. These larvae will attach themselves to a fish or other animal and suck it clean. Eggs are laid by the adult beetle usually in a slit in a water plant stem. Both the beetles and their larvae float to the surface at frequent intervals and so they can be captured with a net, again especially at night time. There are several kinds of water beetle and the one described is the worst pest of them all.

There are several kinds of dragonfly which visit the garden pond but although the adults do no harm the larvae of these insects can cause damage. Eggs are laid by the dragonflies in the water or very near it, and the larvae which emerge live for some time in the water, preying on anything they can catch. The short-bodied type of dragonfly has a larva which is also short and thick; the well-known long-bodied fly has a larva much longer than this one. Both are carnivorous and can kill small fishes. These creatures can live in the water for 2 years or more according to the amount of food available. The larvae do not move about very quickly but prefer to lie in wait for their prey, which they seize and devour whilst under water.

The water louse (*Asellus*) is another inhabitant of the water. It is rather a flat type of creature somewhat similar to a wood louse, but longer in comparison to its width. These are eaten by many fishes but I have known a sick young fish to be attacked and eaten by a number of them. Although they can be tolerated in the garden pond they must never be allowed in the breeding or rearing tanks. They may be caught by dragging up quantities of weed from a pond and shaking this on a sheet of newspaper.

The freshwater shrimp is a somewhat similar creature but has the characteristic bend in the body like the sea shrimp. This shrimp (*Gammarus*) is not likely to do any harm in the pond and can be used as food. However, they can eat small fishes and other animals and so must be kept from the breeding tanks.

A point to remember about pests which may be in the pond is that when these creatures are small they can be eaten by many types of fishes. The tench is a fine fish for clearing up many unwanted visitors and even goldfish will eat many if they are not given too much artificial food. An annual cleaning out of the pond gives the aquarist a chance to get rid of many of the larger types of pests, such as leeches, larvae of beetles and dragonflies and water boatmen.

Inheritance of Guanine in the Goldfish

by A. J. KLEE

THE inheritance of reflecting substance in the goldfish has been discussed at length in the aquarium literature (Affleck, 1958; Ison, 1960) but it is by no means a "settled" subject. I do not propose to review this literature in detail, but briefly it has been held that there are three basic conditions, namely, 'metallic', 'nacreous' and 'matt', which depend upon the occurrence of a crystalline material known as guanine in either (or both) of two layers in the skin of a goldfish. The first layer is under the scales and the second is located at the juncture of the dermis and the adipose layer. Should guanine be present in the first layer we have a 'metallic' condition; if in the second layer only, a 'nacreous' condition; if in neither layer, a 'matt' condition. For the mechanics and additional details, I refer the reader to the bibliography appended.

It has been postulated that the mechanism of inheritance of this reflecting material in the goldfish is simple and non-dominant, controlled by a single non-sex-linked gene with two alleles at a single locus. In other words, the theory would have us understand that there is one allele for metallic, call it *M*, and another for matt, call it *m*, and that their manifestation is as follows:

Genotype (genetic make-up of the fish)	Phenotype (physical appearance of the fish)
<i>MM</i>	metallic
<i>Mm</i>	nacreous
<i>mm</i>	matt

By following this theory to its logical conclusion, the crossing of two 'nacreous' goldfish would proceed as in Table 1, resulting in 50 per cent of 'nacreous', and 25 per cent each of 'metallic' and 'matt' goldfish.

Table 1
Mm male

		<i>M</i>	<i>m</i>
<i>Mm</i> female	<i>M</i>	<i>MM</i> (metallic)	<i>Mm</i> (nacreous)
	<i>m</i>	<i>Mm</i> (nacreous)	<i>mm</i> (matt)

Several substantive objections have been made to this theory, however (Morris, 1958; Perkins, 1960). It has been pointed out that goldfish occur in every conceivable intermediate condition between the two extremes of 'metallic' and 'matt'. Furthermore, instances have arisen whereby the phenotype unexpectedly did not adequately reflect the presumed genotype and thus we have had devised 'mock-metallic', 'pseudo-matt' and a host of other ingenious terms to describe these conditions. Con-

sequently, I for one do not believe the existing theory and, furthermore, am of the opinion that although the terms 'metallic', 'nacreous' and 'matt' are valid enough properly used, they leave much to be desired when it comes to using them as adjectives for individual goldfish.

One of the problems is that the inheritance of guanine in the goldfish is controlled by genes acting at two loci, not one. One of the loci relates to the upper guanine layer and the other to the lower layer. Furthermore, the amount of guanine present at each locus is not a qualitative factor but a quantitative one. It is not, for example, a matter of having guanine under the scales or not having any there, but rather a question of what percentage of the layer is covered. Thus we have in goldfish an example of what is known as the "multiple-factor hypothesis". This assumes that there is a series of independent genes (at each of the two loci) for the quantity of guanine in each layer, and that these genes are cumulative in their effect. Each gene, for example, contributes some unit of coverage to the overall coverage in each layer.

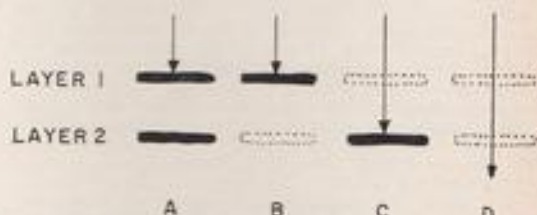


Fig. 1. Presence of guanine in upper or lower layers of goldfish skin is indicated by black areas in this diagram (see text for details)

Regarding the presence or absence of guanine in the two layers, there are four possible cases (as shown in Fig. 1). Cases A and B result in the 'metallic' condition, case C in the 'nacreous' condition and case D in the 'matt' condition. Assuming random distribution of guanine, suppose *p* is the fraction of layer number one covered by guanine, and *q* the fraction of layer number two so covered. The fraction of the area of a given fish exhibiting case A would then merely be *pq*; the fraction exhibiting case B would be *p(1-q)*; the fraction exhibiting case C would be $(1-p)q$; the fraction exhibiting case D would be $(1-p)(1-q)$. Since cases A and B both result in the 'metallic' condition, we may add these fractions to obtain simply *p*. The results of these calculations are summarized in Table 2.

Condition	Fraction of fish's area
Metallic	<i>p</i>
Nacreous	$(1-p)q$
Matt	$(1-p)(1-q)$

For example, suppose *p*=0.10 and *q*=0.80. We should

Table 3: Guanine coverage in the F₂ generation

P1 and P2 refer to the grandparents of these fish, having 20 and 80 per cent coverage respectively

Number of gene pairs	Percentage coverage of guanine in layer number one												
	P1											P2	
	20	25	30	35	40	45	50	55	60	65	70	75	80
1	25						50						25
2	6.25			25			37.5		25				6.25
3	1.55		9.85		23.45		31.3		23.45		9.35		1.55
6	0.02	0.28	1.6	5.4	12.1	19.3	22.6	19.3	12.1	5.4	1.6	0.28	0.02

then have $p=0.10$ or 10 per cent of the area of a given fish 'metallic', $(1-p)q=(1-0.10)(0.80)=0.72$ or 72 per cent of the area 'nacreous' and $(1-p)(1-q)=(1-0.10)(1-0.80)=0.18$ or 18 per cent of the area 'matt'. These percentages do not mean that every fish in a given brood will be '10-72-18'. Rather it suggests that the overall, long-term 'average fish' will be 10-72-18. (But beware of averages! The 'average' number on a die is $1+2+3+4+5+6$ divided by $6=3\frac{1}{2}$, but don't expect ever to throw this average; if you do throw $3\frac{1}{2}$, I would be tempted to examine that die very carefully or perhaps switch to a different game!)

We do not know how many genes control the amount of guanine in each layer but it can be shown statistically that the greater the number, the less likely it is to obtain an 'average' fish. As the number of these genes increases, the greater is the variability of any brood. For example, let us just consider the percentage covering in layer number one for a moment. A comparison of the kinds of goldfish populations to be expected in the F₂ generation from grandparents (having 20 and 80 per cent covering respectively) whose differences in the quantity of guanine in layer number one are due to 1, 2, 3, . . . , 6 pairs of independent genes with equal and cumulative effects and without dominance, are shown in Table 3. The numbers in

the Table represent the percentage of any brood having the stated coverage.

These computations tend to suggest that the number of genes at each locus is fairly large since goldfish exhibit a wide variability in the 'nacreous' stage. However, the number of genes can hardly be determined by the aquarist without a good deal of experimentation and some knowledge of biometrics (and even then, the determination would only be a rough estimate).

Admittedly, the inheritance of guanine in the goldfish is by no means simple. I do not see, however, that it serves any useful purpose by posing overly simple models which do not accurately reflect the true state of affairs.

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The Freshwater Dogfish

COMMONLY called the dogfish because it swims with its ventral and pectoral fins moving alternately like the feet of a running dog, *Umbra krameri* makes a highly interesting coldwater aquarium pet. It is native to the peat-bogs and marshy areas of the Danube and Dneister river systems in Austria and Hungary, and belongs to the small family Umbridae, which is represented to science and aquarists alike by the single European species, and two others in North America. Freshwater dogfish are closely related to the Esocidae, better known as pikes, but unlike the pikes they do not attack or eat other fishes, and are smaller and less elongated in the body.

The chief characteristics of *U. krameri* are the rather large circular scales, which cover the body and most of the head, the short anal fin set well back, which terminates just opposite to the end of the long-based dorsal fin, and the habit of darting to the surface of the water every now and again for a mouthful of air. As it sinks towards the bottom, it expels the deoxygenated air through the gill-openings in the form of tiny bubbles.

The general colour is reddish brown, darker on the back than the lower sides and underparts. The flanks are mottled with orange to blackish brown. There is a yellowish to reddish longitudinal stripe on the sides, brown

mottlings in the dorsal and caudal fins, and shining gold rims to the large black eyes. The sexes may be distinguished by their size; for whereas the male stops growing when it reaches about 3 inches in length, the female continues to a maximum length of 5 inches or more. Among imported fish, females are much rarer than males.

The species is not particularly active. In fact it spends considerable periods of time idling in the plant life or on the bottom with its body tilted in a slightly head-upwards position. It can, however, move very quickly when it wants to, such as when it endeavours to avoid capture in a net, or is pouncing on its food. Feeding presents no problem; for though in the wild it subsists on worms, small crustaceans, midge larvae and other small aquatic life, aquarium specimens soon learn to accept pieces of raw or cooked lean meat, or plainly cooked shellfish.

It is a hardy species, and will live at a temperature of 45°F (7°C) with no discomfort. Contrariwise, it can stand a temperature in the low seventies (°F) without suffering any harm.

Dogfish have bred many times in captivity in well-planted tanks containing matured, soft, slightly acid water. The breeding procedure is for the female to excavate a

Continued on page 144

Planting the Pondsides for Next Year

by JAS. STOTT

Photographs by W. J. HOWES

IN a modern lay-out for an informal pond the design usually incorporates an area of rock edging in some part of the surround and, sometimes, when a frontal effect is provided, as a background. It is, of course, always a useful feature to include because apart from the special interest this particular section will offer to the pondkeeper it is always capable, if properly constructed, of giving an attractive and colourful display in the late winter and spring. Furthermore, and again if construction has been correctly carried out, it is easily maintained; occasional weeding, the cutting back and trimming of plants when needed from time to time and a top dressing of peat and leaf mould in the autumn generally takes care of things.

If obtained in pots alpines can, in the main, be planted out at any time of the year except, of course, in the frozen conditions of mid-winter, but autumn is a good planting period. This gives the plants time to take hold and establish themselves before the severe winter conditions arrive. Where there has been no previous experience in growing alpines it is wise to avoid, at first, the more difficult subjects and gain experience with easier species. The following suggested plants are easy to grow, capable of offering a pleasant display and are not too vigorous in growth.

Well known, and should be in any rockery, is aubrietia, which can be obtained in many varieties. Three which always look well at the pondsides (they seem to be the right shade to reflect well in the water) are: Lavender Queen, Blue King and Russell's Crimson—all in bloom around mid-May. To go with these varieties of aubrietia one or two clumps of alyssum provide an ideal contrast and two varieties are to be recommended: *A. saxatile* Dudley Nevill and a smaller one, *A. idaeum*, which is really attractive, growing only 3 inches high.



Astilbe sinensis in flower



Alyssum is a plant recommended for the rockery, particularly if aubrietia is present

For the lower regions of the rock edging where the soil is moister and shady positions can be offered, there is a medium-sized *Astilbe* which is worthy of consideration, and that is *A. sinensis pumila*, a native of China growing some 12 inches high. The flowers, an attractive shade of rose-mauve supported on erect stems, form in late July.

To follow the aubrietias one or two of the campanulas will do well for they are extremely attractive plants and fit in well on the slopes of the pondsides rockery. There is a huge family, so whatever the size of the pond and its surrounds there will be a form or variety to fit. For the smaller type of garden pond, however, here are three to consider: *Campanula cochlearifolia* (3 inches in height), *C. haydenensis fl.pl.* (the same height but with pale blue double flowers) and the well-known *C. carpanica* (8 inches in height).

Saxifrages

The saxifrages should never be forgotten in any rock garden and should not be left out of the rock area at the pondsides. Another large genus offering plenty of variety both to suit taste and position, but the selection here must, of course, be very limited. Among the following varieties, however, charm and easy cultivation are offered: *Saxifraga borneriana*, flowering in April, 2 inches in height bearing white flowers over a tight mat-like growth of grey-green foliage; *S.x apiculata*, a lovely pale yellow bearing flowers in sprays during March and early April, about 4 inches high; *S.x Grace Farwell*, a hybrid 3 inches high producing rich red flowers in March. A saxifrage suitable for the lower parts of the rock edging where a damp situation can be provided is *S. granulata*, which is taller growing than those previously mentioned and bears sprays of large, pure white flowers in May. This plant disappears after blooming, as far as can be seen, but it exists as granules



Campanula carpatica, one of the *campanulas* suitable for the slopes of the pondside rockery

in the ground from which, after a few weeks, new growth develops. A variety growing some 15 inches high bearing delightful sprays of pink flowers with yellow centres in July is *S.x Kathleen Pimsent*, and one of the earliest to flower is *S.x kellereri*, the soft pink sprays of which are to be found in January and February. The height of this one is around 6 inches.

When established the varieties of *Phlox subulata* make a wonderful show of colour when in bloom, usually during May and June, and sometimes extending well into July in some parts of the country. The following varieties are outstanding: *Camla*, salmon-pink; *Eventide*, white tinted with pale lavender; *G. F. Wilson*, mauve; *atropurpurea*, deep reddish-purple; *Vivid*, pink with a deeper eye.

One or two species of the gentians should be included in the planting of the pondside rockery. This is one of my favourite alpines and there is no blue exactly like gentian blue for purity. It is a large genus, over eight hundred species with many developed hybrids providing a wonderful range of beautiful plants. Contrary to popular thought there are other colours apart from blues; the genus has species producing flowers of white, yellow, scarlet and gold. Some of the species are difficult to cultivate, others are easy, and some are best described as temperamental for



Phlox subulata var. *Sampson*

they vary in growth from season to season. I intend mentioning but three which I think will do well generally throughout the country under normal conditions. First, for the lower regions of the rock edging where it can obtain a greater amount of moisture in the soil, which should also contain a proportion of peat, there is *G. posnanianthe*, the bog gentian, bearing large, deep blue flowers with speckled bands of greenish-grey spots. They grow to a height of some 8 to 10 inches and bloom in late August and September. The second is for a slightly higher position among the rocks and is *G. verna*, 3 inches high and producing azure-blue flowers in April and May. This plant appreciates plenty of sun and a loamy soil but good drainage. Then there is the loveliest of the autumn-flowering gentians, *G. sino-ornata*, offering its intense blue flowers in late September.

Carpeting Plants

If the rockwork forms a background to the pond the front may well be crazy paved, in which case one or two 'carpeting alpines' look attractive planted here and there between the paving. One of the best for this is thyme and its varieties, two of which are *T. serpyllum* with rosy-purple flowers in June-July and *T. serpyllum albus*, a white variety of the above flowering at the same time.

In the background or along the edge of the rock area where contour outlines can be made to look better with taller planting softening the edges, some of the dwarf conifers are ideal as foliage plants. Two come to mind at once as highly suitable for such a position: *Juniper horizontalis*, flat-growing with attractive grey-green foliage, some 8 inches in height, and *Chamaecyparis obtusa* var. *pygmaea*, flat-topped, fan-shaped branches and slow growing; the foliage is bronze-green and the height is some 18 inches. Where extra height is needed *C. obtusa* var. *ericoides* is a good looking species for one can enjoy its grey-green foliage in spring and summer and the blue-brown shade in winter. This grows around 24 to 30 inches high.

If dwarf growing flowering shrubs are preferred in this position then there is a wide range to choose from, but two that can be recommended are *Berberis stenophylla corallina* nana, of compact habit with coral-red flowers and growing to a height of some 12 to 14 inches, and *Andromeda polifolia* nana, with blue-green leaves and bell-shaped flowers pale pink in colour and growing about 9 inches high. Both of these are evergreens, which is always a virtue with shrubs obtained for pondside planting.

The Freshwater Dogfish

(continued from page 142)

hollow in the sand or grit wherein to deposit her rather large eggs. After spawning is over the male should be removed from the aquarium and the female left to fan and watch over the spawning site. The eggs take about 6 days to hatch out, and after the fry become free-swimming they need copious feedings of Infusoria as first food, followed in a week or two by tiny *Daphnia* and the like. It is said on good authority that the fry are very quarrelsome among themselves, and unless they have plenty of room to swim around in, large numbers of every spawning will die from their injuries before they are many weeks old.

Finally, the tank in which dogfish are kept should never be left uncovered, for the fish is an accomplished jumper, and it is by no means uncommon for a specimen to leap unseen out of the water and terminate its life shrouded in particles of dust on the floor.

Technique for Tropical Marines

by G. STOTT AND H. SHONE

KEEPING tropical marine aquaria has been accomplished with moderate success in Stoke-on-Trent by us, and having been studying this, the most interesting field of tropical fish keeping, for almost 2 years, we think that we have overcome most of the problems, such as the use of angle-iron tanks, tank decoration, feeding and most important of all disease, which with care can be almost avoided.

Note that we say most of the problems. With the procedure set out in this article marines have been kept alive for as long as 8½ months in one tank and 6 months in another tank; these lengths of time we consider to be quite a good achievement, considering the small amount of expert practical advice available at the present time.

At the moment we are preparing to stock with marines once again, and experiments are being carried out to see if we can improve on the diet, by growing marine algae on coral in natural sea water in separate containers placed in sunny positions. This will then be placed in the tanks for the fish to nibble at, as we consider that the lack of this possibly essential item in their diet caused several unaccountable deaths as the months went by. This experiment we hope to have completed by the new year.

A 24 in. by 12 in. by 12 in. angle-iron tank which is sealed with epoxy resin (Araldite) is used, and a glass

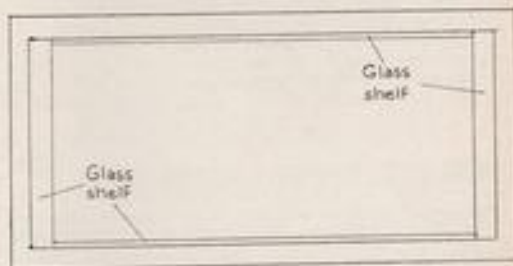


View of inside of top of one aquarium corner showing glass strips in position

shelf is fixed 1 in. below the top angle iron to eliminate metal poisoning; this we found to be the best method, having tried other ways of preparing the tank. The method of sealing is as follows: all inside glasses (corners particularly) are cleaned with paper tissues, using a good detergent, well wiped off again with wet tissues, allowed to dry completely before sealing, and not touched with the fingers after cleaning; with a small stick having a ¼ in. flat end the epoxy resin is pressed into all joints, making sure no air pockets are overlooked, and then left to set for a week.

With care fixing of the shelf is not a difficult operation. You will need two lengths of ¼ in. by ¼ in. glass to fit the width of the tank inside; these are cleaned as was the tank, and with epoxy resin the strips are fixed into position. Next take two lengths of ¼ in. by ¼ in. strips to fit the length, and fix on the same level as the width strips, following the same procedure. Let this set for a day or two, and then fix the glass shelf to this ledge you have made. (Shelf sizes: two pieces 2 in. by width of tank and two pieces 1 in. by length of tank less width strips.) Now cut a glass to

fit just inside this shelf. This makes a very good cover, and if made in two pieces the smaller glass can be fitted with a wooden handle, making it easy to lift for feeding and cleaning.



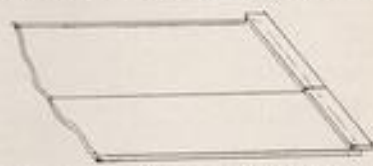
View of aquarium from above with glass shelves in position

The most difficult problem, at first, was the heating. With the conventional method of heating, meaning inside heater and thermostat, we could not eliminate a very small leakage of electricity which acted on the sea water and formed a poison which killed the fish in about 21 days. The same thing occurred with an outside thermostat. Finally we worked out the following method of heating.

A box minus top was made of 4 in. by ¼ in. timber to fit the bottom of the tank. A small cut out was made in the front of this box (to allow access to the 100 watt electric bulb which is used for heating). A conventional bulb holder was placed in the centre of the back, wired to an outside thermostat (adhesive type) set at 75° to 78°F (24° to 26°C). This box can be made while the epoxy resin on the tank is setting. Before the tank is placed in position on the box a piece of household tin foil is stuck to the glass base on the underside with a contact adhesive.

Now the tank can be placed on the heating box and filled with clean cold water to the top, covering the glass shelf, and allowed to soak for a week to purify the epoxy resin.

The sea water we have used is artificial, and the density is kept between 1.023 and 1.027. The most important thing now is to keep this water perfectly clean, which is done by continual filtration. A corner box filter is used for this with the outflow of water and air flowing just below the surface from one corner to the opposite one. This is one thing that we find marine fishes like. The



One end of glass cover (in two parts) showing a method for holding this on the glass shelf. A strip of glass is stuck on in this way at each end

sea water should be changed in small amounts (quarter of the tank every 6 weeks).

For the bottom bird cage sand is sifted of all the small pieces of white shell, is boiled for half an hour, then washed under a fast flowing cold water tap, a tablespoonful at a time, in a very fine net until it is perfectly clean. A layer $\frac{1}{2}$ in. thick is ample. The decorations are mostly of glass rock (which is on sale at most pet stores), coral and sea shells. The tank is now ready for your marine fish.

Their main diet is white worms, *Tubifex* worms and a prepared marine dry food which can be purchased. Raw beef is prepared in the following manner: scrape the meat with a sharp knife, then roll the scrapings into pellets about $\frac{1}{2}$ in. diameter; place these on grease paper and dry for a few seconds in front of a fire to give them a firm crust (this saves them from disintegrating and fouling the water). Feed these one at a time with tweezers.

A length of stout $\frac{1}{2}$ in. plastic tubing (for a dip stick) and a plastic tea strainer are also required for getting any worms or meat from the bottom, as most marines, we find, do not eat food if it is on the bottom. Take out the deposits as

soon as feeding is completed. Dry food is used very sparingly and crushed between the fingers before being put in the tank. Most marines will also eat baby guppies.

For treatment of disease a solution of sodium sulphathiazole, one teaspoonful for 4 gallons, is used by us and cures very well any spots or blemishes in a short time. This may make your water look a faint yellowish colour, which soon clears.

Now for some do's and don'ts:

- DO** Air reject your tank once a day so as not to allow a collection of fish muck.
Change filter medium twice a week.
Check density once a week.
Feed once a day in the evenings.
- DON'T** Leave uneaten food in the tank.
Have a bright light over your tank (a 15 watt bulb is sufficient for a marine aquarium).
Use rubber tubing on the filter (sea water rots it quite rapidly).
Leave any metal in the tank.

OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

The majority of plants just fail to grow in my 4ft. aquarium, though the few *Cryptocoryne affinis* I have made good progress. The tank is situated about 8ft. from a small window in an alcove. I supplement the natural lighting with four 40 watt electric lamps which are kept switched on for about 5 or 6 hours every day. Is there any chemical fertiliser I could buy to make the plants prosper?

Your trouble is poor lighting. Unless you plant with more *Cryptocoryne*, which, generally speaking, are not dependent upon a protracted bright light, then your best plan would be to use 60 watt lamps, and keep them switched on for at least 7 hours every day.

I am a newcomer to the hobby, and my rather large aquarium is stocked with red swordtails, *Barbus arulius*, Malayan angel fish and blue gouramies. I have noticed several of my swordtails have scales missing and small sores on their sides. I should like to know the cause of the trouble and what steps I can take to effect a cure.

In all probability the sores are caused by bullying. Large swordtails, particularly the males, are apt to chase and nip at the sides of their own kind and other fishes. Malayan angel fish, blue gouramies and *Barbus arulius*, too, sometimes develop into persistent body-nippers. The best thing you can do is to keep a close watch on the behaviour of your fishes and see if you can detect the culprit, or culprits. The answer then will be to remove the offending species from the aquarium. In the meantime, keep the fish well nourished on live and flesh food to build up their resistance against disease. If, however, the sore places grow larger and more angry-looking, net the fish and swab the affected areas with a piece of cotton wool dipped in neat T.C.P. or a deep pink solution of potassium permanganate.

I have prepared a small tank of amber-tinted peat water for spawning *Aphyoseiatis* species. Can you give me the names of some plants that will thrive under the strongly acid conditions and, at the same time, produce thick tangles of foliage to cradle the fish eggs?

Nitella flexilis, *Najas hingsii*, *Vesicularia dubyana* and *Utricularia gibba* would be ideally suited to your purpose.

I have what I believe to be a pair of opaline gouramies, but although they go through all the antics of courtship no bubble nest has ever been built at the surface of the water. How can I be certain I have both sexes, and if I have how can I induce these fish to breed?

You must have patience. The male fish, which you will know by his darker colours and longer and more pointed dorsal fin, will blow a bubble nest when he is ready. The

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.

best way to encourage spawning is to separate the pair for a few weeks and feed them most generously on a favourite live food. When they are brought together again, a bright top light shining through matted vegetation, shallow water and a temperature of about 78° F (26° C) are the recommended aids to success.

I have just added a pair of *Bledius geayi* to my collection. As I cannot find any information about this species in the books I possess, perhaps you would be good enough to tell me something about the fish's requirements, and where it is found?

B. geayi inhabits shallowish, clear water streams in Madagascar. It thrives best in captivity in a well aerated aquarium maintained at a temperature range of 68° F (20° C) to 75° F (24° C). It will accept any dried and live food and deposits its eggs in dense thickets of plant life. The species will not live for long in unwholesome or overheated water. It is very peaceful.

I set up an 18in. by 10in. by 10in. tank a short while ago. The fine grit has turned black all along the bottom front glass, and the *Fallosoma* plants I grouped at both ends have started to decay from their bases upwards. Please tell me what has gone wrong.

Your compost is causing the trouble. You have either overfed the fish, in which case uneaten food has fouled the bottom, or else the compost was insufficiently washed, or has been spread over a nitrogenous subsoil quite unsuited to aquarium plant culture. The only thing you can do now is to empty the tank and start all over again with a thoroughly washed compost, or new compost, and new plants.

I am desirous of establishing a soft, acid water aquarium, but all the fine grits and bagged composts I have bought and tested have given an alkaline reaction. Is it possible to obtain a really non-alkaline sand or grit?

Your problem is a common one. However, you may be able to solve it locally; for many builders' merchants can supply a really sharp, lime-free, washed concreting sand which is ideal for spreading over the floor of the soft water aquarium.



Photo: Penguin fish (*Thayeria obliqua*) Laurence E. Perkins

I have several penguin fish and one of them is much larger (about 3 inches including tail) than the others. Is this an indication of sex and what is the maximum size for this species?

Your large penguin fish is about the maximum size that is reached by most specimens. It is not an indication that its sex is different from the others. Sexing this species, as with many of the characins, is far from easy, and rotundity of the female when she is ready for spawning is about the only guide that can be given. As you say you have several penguins and they are of adult size it is likely that you will be able to observe behaviour patterns that will indicate a possible spawning pair for removal to a breeding tank.

Can you tell me the formal name of the African striped bush fish, a pair of which I have just added to my collection?

Bush fish is the common name applied to members of the genus *Ctenopoma*, or African climbing perches. It is likely that the fish you have just acquired is *C. fasciolarum*, which in the adult form has yellowish brown sides decorated with six or more dark bars. Brownish streaks and blotches also adorn the dorsal, caudal and anal fins.

The temperature of my living room does not fall much below 70° F (21° C) even during the coldest days of winter. What small exotic could be placed in an unheated aquarium kept under such conditions?

Among the several species most likely to remain in good health and colour in your unheated tank (down to the middle sixties, °F) are White Cloud Mountain minnows, black-banded sunfish, *Corydoras paleatus*, bloodfins, *Barbus golius*, *B. semifasciatus*, *B. ticto* and *Chromis erythrogaster*.

An aquarist friend has informed me that there is a catfish or loach from Thailand which eats all the algae from the sides of an aquarium and the plants. Is this true, and is the fish easy to obtain?

We imagine that *Gyrinocheilus aymonieri* is the fish your friend referred to. This species is perhaps the best natural eradicator of algae known to aquarists at the present time. It is usually called the Siamese sucking loach, and is obtainable every so often from all the well-stocked tropical fish dealers.

November, 1964

I should be grateful for some information regarding *Anabas anabae*.

Anabas (Ctenopoma) anabae is an air-breathing labyrinth fish native to tropical West Africa. It is peaceful by nature, easy to feed on live or dried food, and reaches a maximum length of about 3 in. Regular tropical temperatures suit it.

I am converting a small bedroom into a fish room to accommodate four 24 in. by 12 in. by 12 in. tanks. I should like to have your opinion on the cheapest form of heating. The local electrician suggested tubular heating controlled by a thermostat, but this would cost about £10 to install, and he would not guarantee that the tanks would average 75° F (24° C) in the coldest weather.

For only four tanks the cheapest form of heating would be ordinary immersion heaters controlled by a thermostat. If the four tanks are stood end to end, and well lagged with insulating material on the undersides and along the backs, there will be great saving in electricity used.

Keeping the Heat In

TO avoid excessive loss of heat from tropical tanks in unheated rooms during winter, cover the back, ends and bottom of each tank with an insulating material. A useful substance for this purpose is expanded polystyrene (sold as ceiling tiles or in sheets for heat insulation). It can either be fixed by adhesive to the tank frame or if cut accurately to size first it can be pressed into position against the glass panels and will be held there by the metal frame. It is useful, too, to have a spare sheet cut to fit over the front viewing panel on extra cold nights or for use in emergency such as occasioned by sudden heater failure or an electricity 'power cut'.

The Aquarium "Earth"

(continued from page 134)

will flow, the degree of which will depend on the resistance between the appliance and earth; this current may or may not be sufficient to blow the fuse, but if it is not then touching the frame and water could be lethal. If on the other hand the resistance is very low and the current blows the fuse, then earthing the frame in this case would have had the desired effect.

A very important point arises here. Given the same earthing conditions, contact through water at mains voltage is far more lethal than contact through a metal at the same voltage; in fact, relatively small voltages through water can be lethal.

Therefore, the primary consideration with home aquaria is to earth the water, and to earth the water as close to the electrical appliance as is possible. Further, the appliance must be fused and the fuses correctly rated for that appliance. If now you choose to earth all exposed metal parts it is perfectly safe to do so.

I must point out that the purpose of this article is not to put the aquarist into fits of fear every time he has to touch the water in the aquarium; it is conceived to dispel a common myth, that is, earthing the frame only affords complete safety.

In concluding, I would stress the point again that it is the water that possesses the greatest potential danger and therefore logically warrants the greatest precautions.

E. R. Ward

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Our Readers Write

Criticism

I HAVE been keeping tropical and coldwater fishes for just over a year now and I try to further my somewhat scanty knowledge of this fascinating subject by reading *The Aquarist and Pondkeeper* every month.

I was rather surprised to read, in the September issue, the letter from Mr. E. R. Ward, in which he makes several observations about the methods adopted by Mr. D. W. Amis in "Breeding the Neon Tetra" (*The Aquarist*, August).

Criticism never really hurt anyone, but I think if anyone is going to make a criticism, then it ought to be constructive. The remarks made by Mr. Ward about "the phantom furrier, who working by night supplies various eggs with fur coats" and "he neglects to say whether his neons take milk and or sugar with their tea" seem to me to be completely pointless and almost childish.

Surely if a person succeeds in breeding a hard-to-breed species his methods must have been reasonably good even if not obvious. The result is the important thing, not the method adopted.

In the book *Encyclopedia of Tropical Fish* (Axelrod & Vorderwinkler) there is a chapter on "Mystery Fishes", which is about various species of fishes which have never been bred in captivity; the authors invite the hobbyist, breeder etc. to have a go at breeding these "mystery fishes" and, if successful, to publish their methods for the benefit of others. This I consider is simply what Mr. Amis has done.

L. J. HAKES,
Watford, Herts.

Thanks

MAY I, through the columns of your journal, thank all the competitors at this Society's National Open Show and say the wonderful success of this venture was in no small way due to their support. My Society wishes me to convey its heartfelt thanks and assure them that next year with larger aquaria and greater numbers we shall not limit the size, and will be increasing the schedule to over 100 classes. Once again on behalf of the N. & D. A. S. a very large thank you for your support.

W. J. CHRISTIAN,
Show secretary,
Nottingham & District
Aquarists' Society.



The AQUARIST Crossword

Compiled by M. W. SAUNDERS



CLUES ACROSS

1. Common name for *Aeromonas* *aerolans* (5, 7).
6. Scientifically, *Thayeria* *obliqua* (7, 4).
9. Sounds like live food for fishes, run for their lives (4).
10. When cloudy water has, it's a joy to behold (7).
15. Another name for a type of hyacinth (*The Aquarist*, October, 1963) (7).
16. One requirement for breeding white worm cultures (4).
18. Very popular aquarium plant gets twisted occasionally (11).
19. Popular underwater sport (5, 7).

CLUES DOWN

2. Provides protection for certain water dweller (5).
3. Descriptive of the iron used on fish tanks (6).
4. Made of brass—and ground (6).
5. The colour of the french run is mixed (5).
7. About the length of a White Cloud Mountain minnow—and a worm (4).
8. Ready for breeding (3).
9. You may have a burning desire to own this fish (5).
11. Useful when your main heater fails (3, 5).
12. Sea salt? (6).
13. Not necessarily sign of affection when produced by a certain gourami (5).
14. A talk consisting of mixed-up bird noises (6).
17. Different in nature (5).

Solution on page 151



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

AT the Nottingham and District A.S. meeting for September the speaker was Mr. C. Hill a member of the Society who showed part of his extensive collection of stamps depicting fish from all corners of the globe. Many of these fish had been seen on Mr. Max Gibbs' stand at the recent show. The Society is pleased to announce the enrolment of fifteen new members to date as a direct result of the show. The raffle prize this month was won by one of these new members, Mr. B. Skelton.

The table show this month was for coldwater fish and reptiles. Mr. C. Hill winning all prizes in the coldwater section. Mr. Walker won first prize in the reptile section and Miss Walker second and third. The Society would like to express its grateful thanks to the many people and the various Society's far to numerous to mention individually who gave their fullest support at the annual show.

AT the Llantwit Major A.S. presentation dinner Mr. K. Farran presided and welcomed the forty members and guests who attended from Barry, Bristol and Newport societies. Mr. J. Wheeler proposed a toast to the Llantwit Major Society. He stated that he always enjoyed his visits to S. Wales. The President, Alderman P. J. Smith, C.B.E. responded and thanked Mr. Wheeler for the manner in which he made the toast. Mr. D. Songhurst proposed the toast to the guests, and Mrs. E. Jones of Bristol replied, thanking the members for an enjoyable evening. The president presented the W/Case, Smith Cup to the member of the year to Mrs. J. Amis. He also presented the Presidents Cup to Mr. R. Wigg for breeders livebearers and the Stampton Cup to Mr. D. Songhurst. Mr. J. Wean presented the Jimmy Holmes Memorial Cup to Mr. D. Amis for breeders egglayers. Mrs. J. Wheeler of Bath presented the Miles Thomas Points Cup to Mr. R. Wigg. Mrs. S. Steer presented the Mr. and Mrs. Steer Guppy Cup to Mr. R. Wigg. Mrs. Amis presented the J. and D. Amis Cup to Mr. Songhurst for furnished aquaria. The chairman presented replica cups to last year's winners.

AT the October meeting of Bedford and District A.S. the table show results were as follows:—Home brood (Carrin Trophy): 1, B. Thompson—83 points (panchax); 2, Mr. Jeffs—77 points (salfin mollie); 3, Mrs. Jeffs—76 points (liberty mollie); 4, Mr. Wells—71 points (shubunkin). Breeders pairs: 1, Master D. Angel—84 points (apistogramma ramirezi); 2, B. Thompson—82 points (cherry barb); 3, B. Thompson—69 points (panchax); 4, B. Thompson—78 points (royal tetra).

THE Coalville and District A.S. had one of their most successful meetings in October when an informal "Any Questions" session was held. Guests attended the meeting from the Leicester and Corby Societies and the panel consisted of representatives of the three Societies with the chairman of Coalville, Mr. J. H. Hensley, in the chair. A good enthusiastic audience asked several questions before the session was closed by the chairman for time reasons. While the session was in progress, a table show in four classes was judged by two members of the Leicester Society. There was a record number

of entries and winners were:—Male sword: 1, C. Gerratt; 2, J. A. Reed; 3, F. Bower. Black widow: 1, C. Crosswell; 2, J. Beet; 3, J. English; 4, P. Stratton. Tiger barb: 1, A. Taylor; 2, Miss A. Ward; 3, P. Turner; 4, G. Degg. Zebrafish: 1, M. Yeomans; 2, J. A. Reed; 3, H. Seal; 4, J. Beet.

THE Southend, Leigh and District A.S. recently had a most successful outing to the London Zoo. A display of tropical fishes appeared in conjunction with Leigh Horticultural Society's autumn chrysanthemum show and in the annual competition for members gaining highest points in table shows, leaders are now:—1, B. Martin (20 points); 2, A. J. Mason (13 points); 3, R. Brown (12 points); 4, B. Dunn and D. G. Perrot (both with 11 points). The trophy, which is held by the winner for one year, is the Southchurch Cup. The Society entered for the inter-club furnished aquaria class at the East London Aquarists and Pondkeepers Association Show and took third place and the membership of the Society is now approaching 60. The secretary is: V. C. Pickett, 2, Whistall Road, Great Wakering, Southend-on-Sea. (Tel.: Wakering 233).

THE results of the Nottingham and District A.S. show were as follows: Cup winners—Best tropical fish: J. Derris. Best coldwater fish: J. Chadwick. Best fish in show—tropical or coldwater: J. Derris. Best breeders class—Tropical or coldwater: J. Derris. Best furnished tropical aquarium: Workop A.S. Other results:—Arabian—Splendens, males (lighters): 1 and 2, T. F. Jerram (Derby); Miss S. Chambers (Newark). Females (lighters): 1, R. Bird (Kirby-in-Ashfield); 2, M. A. Brown (Corby). Labiosa (thick lipped gourami): 1, A. Mawson (Workop); 2, Purdy (Clifton); 3, A. Mawson. Lilia (dwarf gourami): 1, A. Mawson; 2, B. Booth (Workop). Leeri (lace gourami): 1, Mr. and Mrs. C. Hill (Riddings, Derby); 2, A. H. Cox (Radford); 3, J. Mills (W. Bradford). Trichopterus (blue gourami): 1, J. Mills; 2, G. Swain (Hucknall); 3, K. Hallam (Chaddesden). Gourami, any other species: 1, J. Mills; 2, Messrs. Kendrick and Widdowson (Radford); 3, B. Smith (Daybrook). Anabantids, any other species, 6 in. body size: 1, W. Corby (Dagenham); 2, I. Chadwick (Leeds); 3, N. Nichols (Workop). Barbs—Auratus: 1, M. Davis (Brampton); 2, Mrs. F. Sibson (Workop); 3, S. Stratton (Derby). Conchonius (royal): 1, M. Davis; 2, A. Mawson; 3, P. H. Filiger (Derby). Negrofasciatus (niger): 1, B. Dodd (West Bridgford); 2, G. Wood (Nottingham); 3, K. Riley (Riddings). Oligolepis (checker): 1, G. Bulliment (Nottingham); 2, A. Saxon (Nottingham). Tetrazona or parapentazona (tiger): 1, A. Mawson; 2, K. Riley; 3, G. Swain. Timers (cherry): 1 and 2, A. Saxon (Nottingham); 3, Mrs. J. Stevens (Heanor). Any other species under 3 in.: 1, J. Mills; 2, Miss P. A. Town (Ruddington); 3, R. Hampton (Leeds). Any other species over 3 in. under 6 in.: 1, J. Mills; 2, Mrs. F. Sibson; 3, P. H. Filiger. Bicolor—M. Chrysoptekalon (sharks): 1, J. Mills; 2, A. Bentley (West Bridgford); 3, G. Swain. Characidae—Rosaceus (royal tetra): 1 and 2, J. Derris (Workop); 3, Mr. and Mrs. C. Hill (Riddings). Scholae (black lines): 1, G. Morris (Sherwood); 2, L. Tye (Retford);

3, G. Morris (Nottingham). Innesi (neon tetra): 1, K. Riley; 2, Sanderson (Hucknall); 3, A. Cox (Nottingham). Geocelus (glow light): 1, B. Mills (Arncliffe); 2, A. Gaskill (West Bridgford); 3, B. Mills. Hemigrammus species: 1, B. Mills; 2, I. Purdy (Clifton). Tetraodon (black widow): 1, S. Barratt (Corby); 2, B. Smith (Hyson Green); 3, R. Hampton. Obliquus (Penguin): 1, A. Mawson; 2, E. Smith (Daybrook); 3, Bradlow (Sutton-in-Ashfield). Riddlei (x-ray): 1, A. Saxon (Nottingham); 2, Mr. and Mrs. C. Hill (Riddings). N. Anomalus (pencil fish): 1 and 2, A. Gaskill; 3, R. Martin (Sutton-in-Ashfield). Mangelus (pencil fish): 1, L. Tye; 2, Mrs. Loukes (Ilberton). Thoracocharax - Gasteropeleus - Carnegiella (Hatchet): 1, L. Tye. Caricidae (any other species under 3 in.): 1 and 2, J. Derris; 3, Mrs. M. Burrell (Corby). Poeciliidae—Maculatus variatus (platy): 1, R. Bird; 2, J. Purdy; 3, L. Tye. Hetero, red (swordtail): 1 and 2, J. Derris; 3, A. Mawson. Green (swordtail): 1, M. B. Chambers (Newark); 2, A. H. Cox. Any other variety (swordtail): 1, T. F. Jerram; 2, B. Smith (Radford); 3, Mrs. F. Sibson. Mollies, black (molly): 1, B. Booth (Workop); 2, J. Britain (Lenton); 3, M. Davis (Brampton). Spangled (molly): 1, G. Swain; 2 and 3, J. Britain (Lenton). Any other species (molly): 1, W. Corby (Dagenham); 2, M. Davis; 3, Mrs. E. Sibson. Guppies—Reticulatus (scarfish): 1 and 2, R. Bird (Double sword); 3, K. Bird (Bottom sword); 4, P. Duffy; 5, Miss P. Town (Ruddington). (Triangle and fantail): 1, 2 and 3, J. Allen (Bulwell). (Veil-tail): 1 and 2, P. Duffy. (Gold female): 1 and 2, Mrs. F. Sibson (Workop); 3, Nicholas (Workop). (Pinstrip and swordtail): 1, R. Bird (Grey female); 2, R. Bird; 3, A. H. Cox. Rasbora, danio and varicostatus—Reorio (zebra): 1, A. Mawson; 2, Mrs. F. Sibson; 3, L. Tye. Albino (zebra): 1, Mr. and Mrs. C. Hill. Malabaricus (giant danio): 1 and 2, K. Riley. Albolunatus (white cloud): 1 and 2, A. Mawson. Heteromorpha (chameleon): 1, L. Tye; 2, J. Derris. Tollymusa (silverside): 1, 2 and 3, J. Britain. Rasbora (any other species): 1, P. Filiger; 2, Messrs. Kendrick and Widdowson; 3, L. Tye. Chichidae—Pterophyllum simiki or scalare (angel): 1, L. Tye; 2, J. Derris; 3, J. Bower. Black (angel): 1, J. Derris; 2, Messrs. Kendrick and Widdowson; 3, J. Mills (West Bridgford). Aquadens species under 6 in. (blue scar): 1, P. Duffy; 2, P. Housh (Stapleford); 3, A. Bentley (West Bridgford). Cichlidae under 3 in. (dwarf cichlid): 1, K. Hallam (Chaddesden); 2, M. Davis; 3, Mr. and Mrs. C. Hill. Over 3 in. under 6 in. body size: 1, Mrs. F. Sibson; 2, Messrs. Kendrick and Widdowson; 3, J. Worley (Heanor). Top minnows—Aphyosemion species: 1 and 2, B. Craven (Sheffield); 3, Mr. and Mrs. C. Hill. Panchax species: 1, M. Davis; 2, D. Wells (Thorn); 3, G. Swain. Rivulus species: 1, L. Tye; 2, Mr. and Mrs. C. Hill. Catfish and loaches—Paleatus (catfish): 1, D. Wells; 2, Mrs. B. Gould (Derby). Aneus (catfish): 1, Mrs. Scott (Hyson Green); 2, Bulliment (Daybrook); 3, A. Dixon (Corby). Melanotus (catfish): 1, J. Mills; 2, D. Wells; 3, Mr. and Mrs. C. Hill. Any other species under 6 in.: 1, J. Mills; 2, B. Smith; 3, Mr. and Mrs. C. Hill. Kuhli (coco loach): 1, Mrs. J. Stevens (Heanor); 2, A. Mawson. Cobitidae, any other species under 6 in. (loach): 1, R. V. Dyson (Sutton-in-Ashfield); 2, R. Chadwick (Leeds); 3, Mrs. F. Sibson. Any other species (catfish): 1, P. Duffy; 2, I. Chadwick (Leeds); 3, A. Cox. Alburnidae—Maculoch-Ladageni-Nigrum (rainbow): 1, A. Riley; 2, A. Mawson; 3, A. Cox. Breeders livebearers—Six fish in brood: 1, M. Davis; 2, P. Duffy; 3, Mrs. I. Bulliment. Breeders egglayers—Six fish in brood: 1, J. Derris; 2, A. Cox; 3, A. P. Duffy. Coldwater fish—Carassius auratus (common goldfish): 1, J. Hyth (Nottingham); 2, Mr. and Mrs. C. Hill; 3, J. Mills. London shubunkin: 1, 2 and 3, Mr. and Mrs. C. Hill. Bristol shubunkin: 1, Mrs. C. Hill; 2 and 3, W. J. Christian (W. Bridgford). Scaled fantail: 1, G. Fern (Syston); 2, I. Chadwick; 3, Bradlow (Kirby-in-Ashfield). Black moor: 1, I. Chadwick. Oseada: 1, I. Chadwick. Leuciscus idus (erte): 1 and 2, Mr. and Mrs. C. Hill; 3, Mr. and Mrs. H. Walker (Nottingham). Scardinius erythrophthalmus (rudd): 1, and 2, J.

Ryth, *Tinea tinea* (tench); 1 and 2, Mr. and Mrs. H. Walker; 3, W. J. Christian (West Bridgford). Any other species coldwater under 6 in. body size: 1 and 3, G. Fern; 2, J. Ryth. Breeders, coldwater—Six fish in brood: 1 and 2, J. Ryth; 3, Mr. and Mrs. C. Hill. Plants, tropical or coldwater: 1, A. Gaskell; 2 and 3, Mrs. F. Sibson.

THE annual meeting of the **Macclesfield A.S.** was held recently and the following officials were elected—Chairman, Mr. H. Wilson; vice-chairman, Mr. N. Rogers; joint secretaries, Messrs. H. Wilson and S. B. Cass; show secretary, Mrs. E. Wilson; treasurer, Mr. J. Haskinson; committee, Messrs. R. Bradley, H. S. Lee, H. Davenport, S. Gre and A. Harper. It was decided at this meeting to run an open table show on Sunday, 6th December at B.W.A. Sports Pavilion, Fence Avenue, Macclesfield. Prizes will be awarded for best fish in the show, also medals and other prizes for first, second and third in all classes. Refreshments will be available. Enquiries to Mr. H. Wilson, Glen Cottage, Ecton Avenue, Macclesfield.

THE open table show results of the **Halifax A.S.** were as follows—Anabantids: 1, Mr. Dawson (Workop); 2, Mr. Holdsworth (Bradford); 3, Mr. Wilkinson (Halifax). Fighters: 1, Mr. Burns (Bradford); 2 and 3, Mr. Baxter (Tadcaster). Small barbs: 1, Mr. Forth (Bradford); 2, Mr. Gibson (Workop); 3, Mr. Durrill (Workop). Large barbs: 1, Mr. Davies (Derby); 2, Mr. Föbiger (Derby); 3, Mr. Rodding (Tadcaster). Sharks and lobes: 1, Mr. Dennis; 2, Mr. Hampson (Aireborough); 3, Mr. Wilson (Bradford). Small characins: 1, Mr. Dennis; 2, Mr. Hampson (Aireborough); 3, Mr. Föbiger (Derby). Medium characins: 1, Mr. Barlow (Halifax); 2, Mr. Machin (Workop); 3, Mr. Emms (Bradford). Large characins: 1, Mr. Davis; 2, Mr. Föbiger (Derby); 3, Mr. Hampson (Aireborough). Disc characins: 1, Mr. Gibson; 2, Mr. Greenwood (Bradford); 3, Mr. Bibby (Accrington). Dwarf cichlids: 1, Mrs. Faith, best fish in show (Bradford); 2, Mr. Wilkinson; 3, Mr. Gibson. Angels: 1, Mr. Wood (Halifax); 2, Mr. Barlow; 3, Mr. Haldy (Bradford). A.O.V. cichlids: 1, Mr. Gibson; 2, Master Föbiger (Derby); 3, Mr. Föbiger. Barbours and darters: 1, Mr. Rumbold (Tadcaster); 2, Mr. Bibby; 3, Mr. Föbiger. Egg-laying tooth carps: 1 and 2, Mr. Yeaton (Aireborough); 3, Mr. Grenall (Tadcaster). Guppies: 1, Mr. Dawson; 2, Mr. Machin; 3, Mr. Stottall (Halifax). Mollys: 1, Mr. Tye (Workop A. and Z.S.); 2, Mr. Dennis; 3, Mr. Gibson. Swordtails: 1, Mr. Dennis; 2, Mr. Machin; 3, Mr. Dawson. Platies: 1, Mr. Wood; 2, Mr. Dawson; 3, Mr. Yeaton. Loaches and eels: 1, Mr. Wilson; 2, Mr. Dennis; 3, Mr. Chadwick (Aireborough). Small catfish: 1, Mr. Holdsworth; 2, Mr. Honour (Halifax); 3, Mr. Davies. Large catfish: 1, Mr. Holdsworth; 2, Mr. Honour; 3, Mr. Bibby. Breeders livebearers: 1, Mr. Davis; 2, Mr. Tye; 3, Mr. Davis. Pair egg-layers: 1, Mr. Watson (Aireborough); 2, Mr. Dennis; 3, Mr. Carr (Bradford). Pair livebearers: 1, Mr. Dennis; 2, Mr. Davis; 3, Mr. Wilson. A.O.V.: 1, Mr. Davis; 2, Mr. Hampson; 3, Mr. Holdsworth. Goldfish single tail: 1 and 2, Mr. Chadwick; 3, Mr. Wood. Goldfish twin tail: 1 and 2, Mr. Booth (Bradford); 3, Mr. Hamilton (Halifax).

RECENTLY 50 members and friends of the **Hounslow and District A.S.** visited the Isle of Wight for an inter-club contest with that Society. The result was a win for Hounslow by 31 points to 15. The results were—Guppy: 1, Master Chris Smith (vestials); Hounslow A.S.; 2, Mr. E. Boulton (vestials); Hounslow A.S.; 3, Mr. Davies (fantail). I.O.W. Characin: A tie for first, Master Chris Smith (serpis), Hounslow A.S. and Mr. Mc. Lifford (mercuris), I.O.W.; 2, Mr. Davison (shining heart terra), I.O.W.; 3, Mr. Davies (lomon terra), I.O.W. Catfish: 1, Mr. Davison (paulsara), I.O.W.; 2, Mr. D. Woodward (paulsara), Hounslow A.S.; 3, Mrs. Gilmore (serpis),

Hounslow A.S. Cichlid: 1, Mr. R. Luff (pelmatochromis armatus), Hounslow A.S.; 2, Mr. D. Woodward (pelmatochromis kerbatana), Hounslow A.S.; 3, A tie between Mr. Stevens (jewel), I.O.W. and Mr. Willis (brown scales), Hounslow A.S. Labrynth: 1, Mr. Pratt (terzi), Hounslow A.S.; 2, Mr. E. Luff (black tip), Hounslow A.S.; 3, Mr. Boulton (terzi), Hounslow A.S. Barbs: 1, Mr. Davison (yellow fin), I.O.W.; 2, Master Chris Smith (schuberti), Hounslow A.S.; 3, Mr. Pratt (communion), Hounslow A.S. Livebearer: 1, Mr. R. Luff (and sword), Hounslow A.S.; 2, Mr. R. Barber (and sword), Hounslow A.S.; 3, Mr. Davies (green sword), I.O.W. The Hounslow A.S. now meet at the Territorial Army Drill Hall, Harworth Road, Hounslow, every other Wednesday, the secretary is Mr. D. Woodward, 16, Ellerslie Road, Hounslow, Middx.

SHOW results of the **East London Aquarists and Pondkeepers Association** were as follows—Club furnished aquaria: 1, Basildon and District; 2, Walthamstow and District; 3, Southend, Leigh and District; 4, East London. Club coldwater furnished aquaria: 1, Tottenham and District. Individual furnished aquaria: 1, P. Vicker; 2, H. G. Berger; 3, W. Bannage; 4, D. Mayhew. Propagated plants, large: 1, P. Vicker; 2, R. J. Pyle; 3, W. Corby; 4, P. Vicker. Propagated plants, A.O.V.: 1, H. J. Pyle; 2, E. Gash. Breeders livebearers: 1, W. Corby; 2, G. Gash; 3, P. Corby. Breeders egg-layers: 1, W. Corby; 2 and 3, E. Vickers; 4, P. Adams. Coldwater breeders: 1, 2, 3 and 4, J. Lause. Guppy, male: 1 and 2, E. Gash; 3, P. Corby. Guppy, female: 1, P. Corby; 2, E. Gash; 3, P. Knight. Platy, A.V.: 1 and 2, W. Corby; 3, P. Corby. A.V. mollies: 1 and 3, W. Corby; 2, P. Corby. A.V. swordtails: 1, W. Corby; 2, Chester; 3, P. Knight. A.V. characins: 1, P. Vicker; 2, Staggles; 3, J. Bryden; 4, J. Groves. A.V. barb: 1, J. Bryden; 2, G. Green; 3, P. Adams. A.V. rainbow: 1 and 2, J. Bryden; 3, P. Vicker. A.V. cichlid: 1, J. Bryden; 2, W. Corby; 3, P. Adams. A.O.V. egg-layer: 1, J. Bryden; 2, J. Bryden; 3, H. Staggles; 4, J. Groves. Any colour figure: 1, D. Mayhew; 2, E. Gash; 3, Miss J. Bryden. A.O.V. labrynth: 1, W. Corby; 2, P. Corby; 3, P. Adams. Shubunkins: 1, Chester; 2 and 3, P. Vicker; 4, P. Adams. Fancy goldfish: 1 and 2, R. Dodkins; 3, J. Potts. A.O.V. coldwater: 1, 2 and 3, R. Dodkins; 4, J. Groves. Best tropical fish in the show: D. Mayhew (red fighter). Best coldwater fish in the show: R. Dodkins (34-gps carp). Best junior fish in the show: P. Corby (paradise fish).

THE results of the various classes at the **Bethnal Green A.S.** annual show were—Inter-club furnished (tropical): 1, London Transport A.S.; 2, Walthamstow & Dist. A.S.; 3, Tottenham & Dist. A.S. Inter-club furnished (coldwater): 1, Walthamstow & Dist. A.S.; 2, Tottenham & Dist. A.S. Breeders egg-layers: 1, J. E. Cobden; 2, R. Eldon; 3, R. L. Yeady; 4, P. Bennett. Breeders livebearers: 1, R. L. Yeady; 2, W. Corby; 3, J. E. Cobden; 4, L. F. Clements. Fighter championship cup: 1, R. Martin; 2, W. Corby; 3, J. E. Cobden; 4, P. Bennett. Mollie championship cup: 1, 2 and 3, J. E. Cobden; 4, J. Stewart. A.V. barbs: 1, R. Martin; 2, J. Jones-Palmer; 3 and 4, L. F. Clements. A.V. platies: 1, T. Anquith; 2 and 4, A. Collings; 3, H. Champness. A.V. guppies: 1, W. Wain; 2, L. F. Clements; 3, T. Anquith; 4, J. Wheeler. A.V. characins: 1, L. F. Clements; 2, H. Champness; 3, D. Allan; 4, T. Anquith. A.V. swordtails: 1, J. Wheeler; 2, J. E. Cobden; 3, T. Anquith; 4, J. Stewart. Danios, rainbow and W.C.M.M.: 1, 2 and 3, J. E. Cobden; 4, W. Webb. A.V. cichlids: 1 and 2, P. J. Lobb; 3, M. Davis. A.V. cichlids: 1, C. A. Stevens; 2, R. P. Chitty; 3, R. Martin; 4, R. Harrison. A.V. tooth carp: 1, M. Davis; 2, R. P. Chitty; 3, C. A. Stevens; 4, L. Broomey. A.O.V. labrynth: 1 and 2, J. E. Cobden; 3, R. P. Chitty; 4, R. Bennet. A.O.V. tropicals: 1, J. E. Cobden; 2, L. Broomey; 3, M. Hobson; 4, J. E. Cobden. Best pair (B.G.A.S. members only): 1, T. Jones-Palmer; 2, A. W. Collings; 3, L. Broomey; 4, H. Champness. Best B.G.A.S. members fish: J. Wheeler.

Guppy Challenge Shield (B.G.A.S. member): J. Wheeler. Characin Challenge Shield (B.G.A.S. member): H. Champness. Best fish in show: J. E. Cobden (Vellera mollie). Best team of breeders: J. E. Cobden (Empire terr.)

THE results from the entries in the **Ashton U.L. Aquarists** section of their open show held recently were as follows: Best fish in show: Mr. Hutchinson (Belle Vue). Anabantids: 1, Mr. Campbell (Prestwich & Bury); 2, Mr. Hughes (Belle Vue); 3, Mr. Smith (Stratford). Labors and sharks: 1, Mr. Wilbraham (Oxton); 2, Mr. Hughes (Belle Vue); 3, Mr. Hutchinson (Belle Vue). Small characins: 1, Mr. Hughes (Belle Vue); 2, Mr. Tomkinson (Belle Vue); 3, Mr. Mulla (Merseyside). Medium characins: 1 and 2, Mr. Hughes (Belle Vue); 3, Mr. Mulla (Merseyside). Large characins: 1 and 2, Mr. Mulla (Merseyside); 3, Mr. Hughes (Belle Vue). Dwarf cichlids: 1, Mr. Wilkie (Stratford); 2 and 3, Mr. Hughes (Belle Vue). Angels: 1, Mr. Wilkie (Stratford); 2, Mr. Smith (Stratford); 3, Mr. Lusk (F.G.A.). Cichlids A.O.V.: 1, Mr. Mulla (Merseyside); 2, Mr. Cairns (Belle Vue); 3, Mr. Holroyd (Oldham). Tooth carps: 1, Mr. Wilbraham (Oxton); 2, Mr. Gregory (Oxton); 3, Mr. Walker (Oldham). Barbours: 1 and 2, Mr. Walker (Oldham); 3, Mr. Lusk (F.G.A.). Goldfish: 1 and 2, Mr. Fletcher (Belle Vue); 3, Mr. Bennett (F.G.A.). Mollies: 1, Mr. Wragley (A.U.L.); 2, Mr. Fletcher (Belle Vue); 3, Mr. Eastham (Belle Vue). Plants: 1, Mr. Hill (A.U.L.); 2, Mr. Campbell (Prestwich & Bury). Loaches: 1, Mr. Hutchinson (Belle Vue); 2, Mr. Shore (Oxton). Catfish: 1, Mr. Westhead (A.U.L.); 2, Mr. Wilkie (Stratford); 3, Mr. Smith (Stratford). Goldfish: 1, Mr. Ramsden (N.G.P.A.); 2, Mr. Smith (Stratford); 3, Mr. Smith (Stratford). Shubunkins: 1, Mr. Ramsden (N.G.P.A.); 2, Mr. Smith (Stratford); 3, Mr. Shore (Oxton). Oryzias and lamp-heads: 1, Mr. Ramsden (N.G.P.A.); A.O.V. coldwater: 1, Mr. Smith (Stratford); 2, Mr. Ramsden (N.G.P.A.); 3, Mr. Noke (Ashton). Breeders egg-layers: 1, Mr. Ferguson (Ashton); 2, Mr. Shore (Oxton); 3, Mr. Noke (A.U.L.). Breeder livebearers: 1, 2 and 3, Mr. Shore (Oxton). Breeders guppies: 1, Mr. Griffiths (F.G.A.); 2 and 3, Mr. Bennett (F.G.A.). Pair egg-layers: 1, Mr. Hughes (Belle Vue); 2, Mr. Tomkinson (Belle Vue); 3, Mr. Green (A.U.L.). Pair livebearers: 1, Mr. Ruffley (A.U.L.); 2, Mr. Noke (A.U.L.); A.O.V. not listed: 1, Mr. Shore (Oxton); 2, Mr. Hughes (Belle Vue); 3, Mr. Walker (Oldham).

THE annual open show results of the **Willesden and District A.C.** were as follows: Brook Shield: Mrs. A. Wingrove. Best individual furnished aquaria: Mr. A. E. Welsh. Best single livebearing fish in show: Mr. F. Stone. Junior furnished aquaria: Miss J. Leach. Best entry (male or female) in the guppy class: Mr. T. D. Smith. Best single entry by a Willesden Club member in the common goldfish class: Mr. T. W. Glass. Best single entry by a Willesden Club member in the very variety cichlid class: Mr. R. J. Porter. Best entry in vivitale class: Mr. H. G. Berger. Furnished aquaria coldwater (club): 1, Willesden and District A.C.; 2, Hampstead A.S. Furnished aquaria tropical (club): 1, L.T.B. A.C.; 2, Hendon and District A.S.; 3, Independents A.S. Individual aquaria furnished aquaria: 1, Mr. R. D. Esson; 2, Mrs. A. Wingrove; 3, Mr. A. Sutton. Individual furnished aquaria tropical: 1, Mr. A. E. Welsh; 2, Mr. F. Davis; 3, Mr. S. R. Parker. Junior furnished aquaria: 1, Miss J. Leach; 2, Miss M. Sherwin. Common goldfish: 1, Mr. T. W. Glass; 2, Mr. H. G. Berger; 3, Mr. S. Wingrove. Shubunkins: 1, Miss D. Morris; 2, Mr. G. A. Daniels; 3, Mr. A. Stevens. Native and foreign coldwater: 1, Mr. G. Jennings; 2, Master G. Brown; 3, Mr. H. G. Berger. Veltain: 1 and 2, Mr. H. G. Berger; 3, Mr. W. Leach. A.O.S. or F. coldwater: 1, Mr. R. D. Esson; 2, Mr. S. Wingrove;

3, Mr. A. Sutton. Male guppies to F.R.S. standards: 1 and 2, Mr. T. H. Smith; 3, Mr. R. Eldon. Female guppies to F.G.R.S. standards: 1, Mr. J. Stewart; 2, Mr. G. H. Jennings; 3, Mr. W. R. Sberwin. A.V. mollies: 1, Mr. F. Stone; 2, Mr. J. Stewart; 3, Mr. G. Bostock. A.V. platy: 1, Mrs. I. R. Brown; 2, Mr. R. Eldon; 3, Miss M. Sherwin. A.V. swordtail: 1, Mr. R. Eldon; 2, Mr. J. Stewart; 3, Mr. G. H. Jennings. A.V. barbs: 1, Mr. R. J. Porter; 2, Mr. D. J. Woodward; 3, Mr. W. Stone. A.V. characin: 1, Mr. D. J. Woodward; 2, Mr. L. F. Clements; 3, Mr. G. A. Boudle. A.V. labyrinth: 1, Mr. T. C. Tomkins; 2, Mr. R. J. Porter; 3, Mr. D. J. Woodward. A.V. catfish (ex-corydoras): 1, Mr. R. J. Porter; 2, Mr. R. Eldon; 3, Mr. T. W. Glass. A.V. cichlid: 1, Mr. R. J. Porter; 2, Mr. S. R. Parker; 3, Mr. R. Sanderson. Danios, rasboras, W.G. mountain minnows: 1, Mrs. B. Roberson; 2, Mr. J. Stewart; 3, Miss D. Williams. A.O.V. tetras: 1, Mr. R. J. Porter; 2, Mr. T. W. Glass; 3, Mr. T. D. Smith. Corydoras: 1, Mr. G. Bostock; 2, Mr. L. F. Clements; 3, Mr. D. J. Woodward.

At a recent meeting held at the club rooms, a table show in four classes of fish was arranged. Mr. P. Riddle gave a lecture on "Aquarium Alphabet". The show was judged by Mr. E. Large. Results were as follows:—A.O.V. egg layers: 1, Mr. I. Brown (dermatator musculatus); 2, Mr. D. Smith (Spiny eel). Cichlids: 1, Mr. R. Porter (Convict); 2, Mr. R. Porter (Blue acara). Barbs: 1, Mr. K. Nessall (Chola); 2, Mr. R. Porter (Indian); 3, Mrs. I. Brown (Cherry); 4, Mr. R. Porter (Aeneas). Labyrinth: 1, Mr. R. Porter (Combat); 2, Mr. K. Nessall (Paradise); 3, Mrs. I. Brown (Leeri gourami); 4, Mr. R. Sanderson (Dwarf gourami).

THE Bristol A.S. show results were:—Goldfish (5 in. limit): 1, Mr. H. Jago; 2, Mr. F. L. Nurse; 3, Mr. N. Stamer. Bristol shubunkins (3 in. limit): 1, Mr. M. Annelly; 2, Mr. H. J. Whiting; 3, Mr. L. G. Emery. Bristol shubunkins (5 in. limit): 1, 2 and 3, W. Hicks. Veiltails: 1, 2 and 3, W. Harper. Moors: 1 and 3, T. Dodge; 2, N. Grimston. Telescopes (other than moors), orandas, longheads celestials, bubbleheads, pearl scales: 1, Mr. L. G. Emery; 2, Mr. D. S. Paul; 3, Mr. G. Harper. Nymphs and comets: 1, Mr. D. Headford; 2, Mr. F. Radford; 3, Mr. E. Dunstan. Fantails (scaled): 1, Mr. V. Capaldi; 2, Mr. A. McEvoy; 3, Mr. H. Jago. Fantails (unscaled): 1, Mr. N. O. Grimston; 2, Mr. H. Jago; 3, Mr. J. James. A.O.V. pond or river fish (7 in. limit): 1, Mr. J. Beilford; 2, Mr. V. Collins; 3, Mr. H. Jago. Bristol shubunkins, bred 1964: 1, Mr. H. J. Whiting; 2, Mr. A. R. Pym; 3, Mr. E. A. Mason. Moors, bred 1964: 1 and 3, Mr. N. O. Grimston; 2, Mr. C. Barrett. A.O.V. fancy fish, bred 1964: 1, Mr. E. W. Savage; 2, Mr. D. S. Paul; 3, Mr. D. S. Paul. Teams of 4 fancy fish, bred 1964 (Bristol shubunkins, comets, goldfish): 1, Mr. N. O. Grimston; 2, Mr. L. G. Emery; 3, Mr. W. Hicks. Teams of 4 fancy fish, bred 1964 (Veiltails, moors, fantails, nymphs): 1, Mr. C. Barrett; 2, Mr. D. S. Paul; 3, Mr. V. Capaldi. Bristol shubunkins, matched pairs (sex optional): 1, Mr. W. G. Bryant; 2, Mr. L. Roberts; 3, Mr. W. Hicks. Novice class, Bristol shubunkins: 1, Mr. D. S. Langdon; 2, Mr. C. Clark; 3, Mr. J. Lewis. Furnished aquaria (coldwater): 1, Mr. S. Lloyd; 2, Mr. R. W. Savage; 3, Mr. S. J. Davis. Furnished aquaria (tropical): 1, Mrs. I. M. Stone. Furnished aquaria (inter-club): 1, Bristol tropical fish club; 2, Yeovil A.S.; 3, Bristol A.S. Aquatic plants (coldwater): 1 and 2, Mr. S. J. Davis; 3, Mr. V. Collins. Aquatic plants (tropical): 1 and 3, Mr. G. S. Stone; 2, Mr. L. Challenger. Fighting fish: 1, Mr. J. Mappson; 2, Mr. D. Wilcox; 3, Mr. R. Toote. Labyrinth (excluding fighting fish): 1, Mr. D. Wilcox; 2, Mr. F. Brown; 3, Mrs. Y. Quick. Barbs: 1, Mr. L. Littleton; 2, Mr. P. Jinks; 3, Mr. R. Toote. Characins hemigrammus and hypostomus: 1 and 2, Mr. E. Short; 2, Mr. F. Toote. A.O.V. characins: 1, Mr. G. S. Stone; 2, Mr. G. Gillard; 3, Mr. F. Brown. Cichlids (excluding angels): 1, Mrs. A. James; 2, Mr. J. Mappson; 3, K. Pearce. Angel fish: 1 and 3, Mr. D. Wilcox; 2, Mr. L. Reeves. A.O.V. egg layers: 1, Mr. G. Stone; 2, Mr. F.

Brown; 3, Mrs. Y. Quick. Catfish: 1, Mr. F. Brown; 2, Mr. G. S. Stone; 3, Mr. T. Smith. Best fish in show: Mr. T. Dodge (moor). Short tail guppies: 1 and 3, Mr. R. Pearce; 2, Mr. N. Court. Long tail guppies: 1 and 2, Mr. N. Court; 3, Mr. W. G. Ham. Female guppies: 1, Mr. K. Pearce; 2, Mr. N. Court; 3, Mr. P. Jinks. Swordtails: 1, Mr. J. Mappson; 2 and 3, Mr. T. Smith. A.O.V. livebearers: 1, Mr. J. B. Evans; 2, Mr. D. Wilcox; 3, Mr. J. Mappson. Teams of 6 livebearers, bred 1964: 1, Mr. A. Ibbertson; 2, Mr. J. Brown; 3, Mr. J. B. Evans. Teams of 6 egg layers, bred 1964: 1 and 3, Mr. D. Amis; 2, Mr. D. Wilcox.

AT an Inter-club table show where societies, Halifax, Dewsbury, Keighley, Skipton and Aireborough were represented, there were 113 entries and the results were as follows:—Livebearers: 1, Mr. Campbell (Keighley); 2, Mr. Emms (Aireborough); 3, Master Hanson (Keighley). Barbs: 1, Mr. Watts (Aireborough); 2 and 3, Mr. Price (Keighley). Characins: 1, Mr. Dunford (Dewsbury); 2, Mr. Hampson (Aireborough); 3, Mr. Barlow (Halifax). Cichlids: 1, Mr. Asquith (Keighley); 2, Mr. Wilkinson (Halifax); 3, Mr. Chadwick (Aireborough). Amantids: 1, Mr. Wilkinson (Halifax); 2 and 3, Mr. Chadwick (Aireborough). A.O.V.: 1, Mr. Hampson (Aireborough); 2, Mr. Cooke (Dewsbury); 3, Master Hanson (Keighley). Best fish in show: Mr. Hampson (Aireborough). Judge: Mr. G. Holmes (Bradford).

THE 1964 Annual Convention of Aquarists' held by Hendon and District A.S. will take place on Saturday, 28th November at the usual venue of Whitefields Secondary Modern School, Claremont Road, Hendon, N.W.2 (a short distance from the Brent Cross junction of the A406 and A41).

Guest speaker is Herr Dieter Vogt, Editor of the German aquarium magazine *Die Aquarien*—and *Terrarium-Zeitschrift* (DATE). Herr Vogt makes a special trip from Germany to give his first lecture in this country. He has entitled his lecture "The Problems of Aquarium Science" and he will no doubt cover many interesting facets of the fish-keeping hobby.

The Convention starts at 6 p.m. sharp and goes on until 9.30 p.m. Regular visitors to the Conventions need no reminding of the arrangements, ample coach and car parking, refreshments at popular prices, bumper raffie, VIPs to answer questions, etc.

Club members are requested to obtain their tickets, 2s. 6d. for adults, 1s. 3d. for children under 15 years, via their club secretary who should write to the Hendon A.S. secretary, Mr. A. E. Stevens, 2, Dallas Road, Hendon, N.W.4, who will be pleased to send further details.

MANY members of Welsh aquarists societies met at Newport to exhibit at the second open show and exhibition of tropical fish and plants held by the Newport A.S. Principal awards were:—Best egg layer and best fish in show: Mrs. A. James. Best livebearer in show: D. W. Amis. Best coldwater and special award: M. Paery. Junior trophy: Master David Hodge. Breeders egg layers: D. W. Amis. Breeders livebearers: A. Ibbertson. Siamese fighters: 1, Mrs. D. G. Morgan; 2, B. Kelly; 3, Mrs. J. Hobbs. Labyrinth: 1, R. Harris; 2, Mrs. A. James; 3, R. Harris. Barbs: 1, W. Tudor; 2, F. G. James; 3, A. Ibbertson. Hypostomus and hemigrammus: 1, W. Tudor; 2, Mrs. Burgess; 3, H. J. Wall. A.O.V. characin: 1, Mrs. A. James; 2, Mrs. Burgess; 3, Miss S. Parker. Angels: 1, Mrs. James; 2, Mrs. Burgess. Dwarf cichlids: 1, Mrs. James; 2, Mrs. Burgess. A.O.V. cichlids: 1, C. W. Lewis; 2, R. Harris; 3, J. Saunders. Corydoras: 1, R. Harris; 2, David Hodge; 3, C. Pemberton. A.O.V. catfish: 1, M. Paery; 2, B. Kelly; 3, C. Lewis. A.O.V. egg layers: 1, Miss S. Parker; 2, H. J. Wall; 3, N. Counsell. Swordtails: 1, Mrs. A. James; 2, A. Ibbertson; 3, R. Harris. Planes: 1, Mrs. Burgess; 2, Miss S. Parker; 3, Mrs. Burgess. Mollies: 1, D. W. Amis; 2, Mrs. James; 3, Mrs. James. Guppies (standard): 1, A. Ibbertson; 2, J. Saunders; 3, S.

Snare, Guppies (fancy): 1, J. Saunders; 2, J. Burgess; 3, B. Kelly. Breeders egg layers: 1, D. W. Amis; 2, Mrs. M. Burgess; 3, D. W. Amis. Breeders livebearers: 1, A. Ibbertson; 2, W. Tudor; 3, C. Pemberton. Planes: 1, R. Harris; 2, J. Burgess; 3, T. G. Wall. Coldwater: 1 and 2, M. Paery; 3, B. Kelly. Juniors: 1, David Hodge; 2, Miss J. Morgan; 3, C. Pemberton.

THE results of the Independent A.S. table show were as follows:—Angels: 1, Mr. P. Tomkins; 2, Mr. W. Hamilton; 3, Mr. S. Jackson; 4, Mr. K. White. Fighters: 1, Mr. J. Kettle; 2, Mr. J. Howard; 3, Mr. F. Tomkins; 4, Mr. J. Clarke. Danios, rasboras and W.C.M.M.: 1 and 2, Mr. J. Kettle; 3, Mr. J. A. Chapman; 4, Mr. J. Clarke. A.O.V. livebearers: 1, Mr. J. Howard; 2 and 3, Mr. J. Kettle; 4, Miss A. Kettle.



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TROPICAL FISH



TROPICAL FISH LIST OCT./NOV. REGULAR STOCKS ARRIVING WEEKLY

LIVEBEARERS		Bloodfin .. 3/- each	Nigger (adult full col.) 7/6 each	Orange Chromides G.S. 8/6 each
Guppies		Penguins (Boehm) .. 4/6	Ticto .. 2/6	Discus 6" .. £18-10-0 pair
Tancy .. 10/- pair		Penguins (Dobig) .. 8/6	Cherry .. 3/-	" 4" .. £12-12-0 pair
Black .. 6/-		Leporenius Species .. 15/- ea 27/-	Cherry (adult full col.) 4/6	" 3" .. £10-10-0 pair
Assorted .. 3/-		Blind Cave Fish .. 3/- each	Cummings (adult) 7/6	
Blue Veil Guppies .. 12/6		Murble Hatchets .. 7/6	Nigger (medium) 5/-	
Red Veil Guppies .. 12/6		Silver Hatchets .. 6/6	Chequer G.S. .. 3/-	
German Hannel .. 45/- each		Nannostomus .. 4/-	Ember .. 17/6	
Lace Guppies .. 6/- pair		Marginatus .. 4/-	Tinfoil .. 5/-	
Swordtails		Nannostomus Anomalus 5/-	Tinfoil (larger) .. 10/-	DWARF CICHLIDS
Red Standard .. 2/6 each		Nannostomus Beckfordi 5/6	Roy .. 2/6	Kribia .. 10/- & 14/- each
Red Large .. 3/6		Salmon Discus (Silver Dollar) 5/6	Hull Banded .. 3/6	Egyptian Mouthbreeder (adult) .. 4/6
Green .. 2/6		Coplin Arnoldi .. 7/6	Golden .. 2/6	Apistogramma
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