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AN article in this issue recommends the use of fluorescent lighting for aquaria, and its author reports satisfactory results with this form of illumination. We discussed this subject in an Editorial earlier this year (March issue) in relation to plant growth, because there is not universal agreement among aquarists on the suitability of fluorescent lighting for this purpose. More information is obviously required, and we are pleased to publish Mr. Lawrence Mee's observations to this end. However, it is possible that there are effects of fluorescent lighting to be considered on aspects of aquarium life other than growth of plants, and a report that has appeared in The Progressive Fish-Culturist (U.S.A.) deserves to be brought to the attention of aquarists.

This concerns the excessive mortality of brook trout eggs in a new fish hatchery of the New York State Conservation Department at Cold Spring Harbor, Long Island. It was observed that of eggs placed in trays in light situations one November 90 per cent. failed to hatch. The cause of this failure was traced to the fluorescent lighting used over the hatching troughs. The tubes were of the 'cool white' type, which emit some rays in the blue region of the light spectrum, rays already shown to be capable of killing eggs of rainbow trout. Although fluorescent tubes have been widely used in fish hatcheries without reports of unfavourable results, it is pointed out by the authors from Cold Spring Harbour that lengths of time of exposure given and intensities of light used can vary, as can the type of tube employed, at different hatcheries. All types of fluorescent tube give maximum light emission in the harmless yellow-orange-red band of the spectrum, but the 'white' types also give significant amounts of the harmful blue emission. The authors conclude that the best type of tube for hatchery use is the 'pink', which gives no blue emission. Whether the eggs of trout are unique among fish species in their sensitivity to this kind of light is not known, but at least aquarists should be aware that the various types of fluorescent tubes are not all of equal suitability.
Tropical Fishes on Stamps

by A. G. K. Leonard

The aquarist and the philatelist find a meeting point on the album page and in the designs of stamps gracing overseas correspondence. Britain now stands alone in retaining the sovereign's head style that has been traditional ever since Sir Rowland Hill first introduced his "little bits of gummed paper" back in 1840, as a means of simplifying Post Office accounting through prepayment of postage charges.

Other countries have long since taken a wider view of the functions to be served by their stamps, turning them into miniature advertising posters presenting a multi-coloured panorama of every aspect of their way of life, scenic beauties, flora and fauna. With such a wealth of subjects available to imaginative designers, it is not surprising that tropical and ornamental fishes have in recent years been increasingly featured on stamps from all over the world, among them parts of the Commonwealth, whose postal authorities are far less conservative than their British counterparts.

Singapore, for example, has this year issued a colourful new series of seven stamps depicting fishes found in Malay waters, which include several popular aquarium varieties. One freshwater fish occurring all over Malaya, exported from Singapore in large numbers, is Pomadasys scaber, better known as the tiger barb. Another is the marine anemone fish, Amphiprion percula, a small brilliant fish living among the tentacles of huge sea anemones on coral reefs: unaffected by their stinging cells, it attracts other fishes into the paralysing tentacles of the anemones, with whom it shares the spoils.

The beautifully coloured barbelin fish, Rainbow hump-nose, makes another attractive stamp subject. This freshwater fish, from peaty streams and ditches of Malaya, is one of the most popular of Singapore's exports to aquarium stockists in Europe and America, along with the brilliant ocellaris clownfish, Amphiprion ocellaris, the dottyback, and the hump-nose cardinalfish, Sphaeramia ocellata. Other stamps depict the educationally valuable messmate cardinalfish, Sphaeramia ocellata, the cucumberfish, Ceylon blue, and the vivid cardinalfish, Sphaeramia ocellata

The postal authorities of Communist China are likewise prolific in their output of propaganda stamps, among which the last few years have seen numerous attractively artistic series that make a strong appeal to collectors. Particularly colourful were the glorious set of 12 released in 1960, each showing a different variety of goldfish, resting in the exotic names of out-folded opechum and waterlily, black back dragon-eye, bubble-eye, red tiger-head, pearl scale, blue dragon-eye, skyward eye, red cap, purple cap, red head, red and white dragon-eye, and red dragon-eye.

Japan had brought out a goldfish stamp 14 years earlier—issued without perforations during the difficult conditions of the early post-war period. This was followed in 1952 with a better version, quietly attractive although sober enough by comparison with the latest fish stamps of other countries.

More colourful and distinctive was the Japanese stamp
Four of the new stamps from Singapore issued this year

and Mali Republics have not been slow to capitalise on the philatelic appeal of tropical fishes, and the 1959 series for the French Somalilands has this summer been followed by a similar set from independent Somalia. Away in the Pacific, New Caledonia has stamps depicting fishes from the Noumea Aquarium, and the enterprising Post Office of the Maldives Islands in the Indian Ocean is sure of a stamp bestseller with the eight triangles it is bringing out this year, all showing tropical fishes.

The steadily expanding array of foreign stamps with these subjects already runs into three figures, more than enough to present a challenge to the philatelist wishing to form a sideline collection or the aquarist who would like to add an unusual entry to his hobby. Most of the stamps are obtainable quite cheaply from stamp dealers, several of whom now make a speciality of supplying stamps by themes and topics rather than by countries.

Mounted and written up, they make a fascinating and colourful display, which need not necessarily be confined to the pages of an album. One or two neatly arranged sheets in frames would make an original wall decoration in the fish room, sure to attract the interest of friends.

'Vesting' fishes

By R. E. Macdonald

Seasonal changes occur, however slight, regardless of geographical location. This applies to all corners of our planet, whether it be in the middle of the Kalahari Desert or at the North Pole! As a consequence, these seasonal pulsations cause an ebb and flow of life to varying degrees in all of Nature's creations.

One need not be astronomically observant to recognise the effect of seasonal changes, for we see the result all around us. For example, note how the leaves fall from the trees in autumn and flowers lose their blossoms. Note how the beast, squired and hibernates through the cold winter months.

Some fishes, such as the "annual" species (e.g. genus Notobranchus), are severely affected by seasonal changes, but most simply suffer a slight fall in the water temperature which causes them to become less active in their sex life and so allows them a period of rest and recuperation. There is absolutely nothing to be achieved by keeping fishes at summer temperatures all the year round, but an increase in vitality the following summer will be noticed if they are allowed to rest by lowering the temperature of the water in the aquarium to an average of 72°F for a period of 4 months at any time between October and the following March, the best period being from November to February. The temperature of the water during the "resting" period will vary according to the different species but, as a guide, 72°F is a fair average for the majority of tropical fishes.

The temperature should always be lowered gradually, for the fishes will suffer severely from a sudden drop and the fall in any case should never be allowed to exceed 8°F below that at which the water is normally kept. During the summer months it hardens the fishes if the temperature is allowed to fluctuate slowly within 5°F either way of the mean temperature.

The daily light period should not be decreased during the resting period for the vegetation will still require from 10 to 12 hours of light each day.

September, 1962
Breeding the Dwarf Gourami

by J. D. Loader

The dwarf gourami (Colisa lalia) is one of the most desirable of aquarium inhabitants. It is colourful, peaceful and hardy but tends to be rather nervous in a sparsely planted tank. It will eat any food, but notice must be taken of the very small mouth, particularly when fry are being raised. As this is intended to be a practical article it must be made quite clear that this species is easy to breed, even for the beginners, but that at least three tanks are required if the majority of the brood is to be raised to maturity. In the writer's fish room six tanks are reserved for this species. Two of these are planted 18 in. by 10 in. by 10 in. tanks for conditioning the parent fish, one is solely a breeding tank and the other three are 24 in. by 12 in. by 12 in. 'growing-on' tanks. Larger tanks would be even more desirable.

Water Requirements and Conditioning

The main requirements for breeding these fish, as incidentally for all other fishes, is to have a pair of them, in first-class condition, together in a suitable environment within the correct temperature range. Let us first consider the water requirements of this species. I can only say that they breed satisfactorily in water supplied by our local water board, which measures slightly alkaline (pH 7.2), hardness 23°. There is no reason to suppose that water supplied in any other part of the country should not be suitable.

Dwarfs are easily brought into breeding condition. The way this is done is to give them their best tank conditions possible. The sexes are separated and no more than two of each sex are kept in a clean, planted 18 in. by 10 in. by 10 in. tank with plenty of live food. At the present time I use quite a lot of Daphnia, only because I live quite close to an abundant source of supply. At a temperature of 74-78°F (23-26°C) they can be brought into breeding condition in a little under 2 weeks. I use no aerators, preferring to rely on ample surface area per fish.

Preparing the Breeding Tank

It is best to start with a clean dry tank, mainly to avoid snails or small eggs. These hatch extremely quickly and may endanger the gourami eggs. The tank, which may be 18 in. by 10 in. by 10 in., or larger for preference, is filled to a depth of 6 inches only with clean tap water. There is no need for any gravel but there is no reason why it should not be used; the only point to bear in mind is to see that if any rooted plants are introduced no snails or snail eggs are present on them. What is necessary is a small portion of floating plants. I use Salvinia and duckweed only because I have plenty. Riccia is just as good, if not better, for the dwarfs to use to make their nest.

The plumpest female is then selected and placed in half a jar of water from her own tank and floated in the breeding tank. Similarly the chosen male is transferred to the breeding tank. It is most important not to shock the fish by drastic changes of water or temperature when the temperatures have equalised, after perhaps half an hour, the fish are allowed to swim out into the breeding tank. They will probably go to the back corners of the tank and stay there for several hours, but do not worry about this as they are very timid. The thermostat controlling the breeding tank is then adjusted to be as near to 80°F (27°C) as possible but the fish are not fed during the time they are in the breeding tank.

You may be tempted to watch the new-building and actual spawning, but I leave them strictly alone and remove the female 48 hours after introducing the pair to the tank. This is long enough for them to spawn if they want and short enough to prevent them eating the fry, which usually hatch within 24 hours of removing the female. I find that the fry are free-swimming within 24 hours of hatching and the male may be removed at any time after this, although male dwarf gouramis do not seem to eat the fry. The next month is the difficult period. I feed for the first week on water green with algae, green water and tube-fed liquid fry food mixed or tubed liquid fry food by itself. My method is to mix five drops of tubed liquid fry food with half a pound jam jar of green water and float this in the tank until it reaches the same temperature as the water in the tank. This amount is fed to the fry three or four times a day but no more should be added whilst it is apparent that there is still some food in the tank. Another point to watch if the breeding room is not space-heated is that there is an adequate cover on the tank, so that the air above the surface of the water is not much cooler than the actual water.

Diet for Rearing

In the second week tube-fed liquid fry food plus brine shrimp is fed as some of the fry will still be too small to take brine shrimp. At the end of the second week the temperature of the water is gradually reduced to about 75°F (24°C). In the third and fourth weeks brine shrimp and micro worm are used alternately for feeding. By this time some of the fry will be 3 to 4 inches long. These are moved with a ladle or large spoon to the first growing-on tank, also adequately covered and carefully adjusted to the same temperature (75°F). A fortnight later, when the fry are 6 weeks old, a great difference in size will be noticed.

At this stage the fry are sorted into three different size groups in the three growing-on tanks whilst the breeding tank is cleaned out ready for another brood. The fry are fed rather heavily with dried food, alternated with standard live Daphnia according to the size of the fry. A small Corthyodrake melanostomus or amare is kept in each of the growing-on tanks to eat any surplus of food that falls to the bottom. Every fortnight the larger fry are moved on to the next tank.

At 4 months the majority of the fry will be about 1 inch long but it may still be difficult to sex them. At 6 months the males will have started to develop the males coloured as the females, but it is true that they do not show their full colouring until they are brought into breeding condition and have mated once, after which they retain their full and beautiful colouration. Although sometimes over 200 eggs hatch, at no time has the whole brood been raised. The reader will immediately jump to the conclusion that the larger fry eat the smaller fry or that the carps in the growing-on tanks eat them. This is not the opinion of the writer, and there are several other possible reasons.

THE AQUARIIST
An Aquarist and Fluorescent Lighting

by LAWRENCE MEE

FLUORESCENT lighting is right for tropical aquaria. It is true that the initial cost is high, but the following report will indicate that to one aquarist at least the benefits outweigh this disadvantage.

Two months ago I made the fitting permanent, and the 36 inch tank I am setting up at present will have it from the start. I recommend it for anyone taking up the hobby, as well as for aquarists of long standing.

The main advantage of fluorescent lighting is that the tube remains quite cool. It follows that water circulation is achieved by the tank heater, as well as for aquariums of long standing.

The small Cryptocoryne alba and Vallisneria spicata plants had only the colder water 12 inches down, which was evidently too cool for healthy growth.

I used different sizes of bulbs to get matters right. The recommended single incandescent bulb was not only adequate, but it was cheaper too. The results of experiments were always kept, and related to the original bulbs. The idea now was that the collection of the filter would keep the temperature at all depths. Despite the lighting being mainly by the bulbs.

Cacti in the Fish House

Cacti need to be reported when they reach the side of the pot or are obviously too large for the pot they occupy. If the soil in a pot remains wet for some time the collection have dried out this is a danger sign. The drainage hole may have become blocked and if left like this the plants would soon die. Repotting at once. When doing so remove all the old soil, as this will be “ween out”. When placing the plant in a fresh clean pot see that there is sufficient drainage, but do not use too many crocks or there will not be enough space for good soil. If special cactus compost cannot be obtained use John Innes potting compost no. 1, to which add one-sixth part of course washed river grit.
Preparing Fish for Showing

by A. BOARDER

AFTER rearing some fancy goldfish it will now be the ambition of the breeder to exhibit his fish. Unless a member of a club there is small chance of the exhibitor having much success against one who has exhibited first at a club show. At a club show a member has the opportunity of seeing his fish against other good ones and so is better able to realise what the prospects are of a win in open competition. He can also get many helpful tips about showing, which anyone not a member of a club would be unable to ascertain.

If anyone wishes to exhibit at an open show my advice is for him to join a club first and then gain experience there. Until the fish have been up against others it is very difficult for the owner to assess the value of his specimen. He may have overlooked a fault which might be apparent to an experienced aquarist. If there is no club or society in the near neighbourhood of the intending exhibitor it will be very difficult for him at the beginning. He should attend a big open show and take many notes of the type of fish that win in the classes in which he is interested.

Every intending exhibitor should be in possession of the standards of the fish he wishes to exhibit. These can be obtained through his club secretary or from the Federation of British Aquatic Societies. He must then make himself conversant with what is required, apply for the schedule of the show in good time and read it carefully. It is normal for all fancy goldfish to be shown separately, not in pairs. There may be a class for your particular fancy but nowadays it is probable that your fish may have to compete with other varieties. The general open show schedule calls for: (1) common goldfish; (2) shubunkins (usually London and Bristol together); (3) veiltails; (4) fantails; (5) moors; (6) any other variety.

At small shows these classes may even be reduced and your fantail may have to compete with veils or orandas. Make quite sure which class you are able to exhibit in, fill in the schedule correctly and send it off in good time. Having made up your mind which fish to exhibit it is a good plan to run them into a show-sized tank as often as possible; every day is the best. Give a few Daphnia each time so that the fish expects this treat, and it will keep on the move when it is placed in the show tank. This procedure will get the fish used to a show tank, when it is likely to show off its good points to an advantage. It is not only that a good mover will get points for deportment but a healthy well-drilled fish can appear much better than the one which lies on the bottom of the show tank in a fit of collapse. I have had to pass over many a fish that has just refused to move and display finnage enough for it to be examined.

When you get to the show, report to the show secretary, who will give you your tank numbers and class position. Make quite sure that you have the right tank. Usually the first number on the slip is the class number and the second the number of the individual fish in that class. The tanks may have been filled beforehand. If the water is quite cold test it for temperature. In warm weather the carrying case must have been warmed up to 80°F (27°C), and if the show tank has been recently filled from a tap, the temperature of this water may be in the upper forties. This will shock a fish and put it clean out of the running. It is a very bad policy to put your fish into tanks that have just been filled. If the water came from a high-pressure pipe it is certain to contain excess of oxygen. This can cause the fish to become covered with bubbles and be very distressed.

Once the fish are in the tank there is no need to feed them, apart from the few Daphnia at the start. A fish on the lookout for food is more likely to keep on the move than one which is so full that it has no need to move about at all. Do not be afraid that your fish will starve whilst it is in the show tank. All varieties of fancy goldfish can go for weeks without being fed.

When judging is finished it may be possible to have a word with the judge: wherever your success this is well worth while. Don't be too downhearted if you do not win. Your fish may have refused to move whilst being judged or have been a bit out of sorts. It may win next time out. Anyway, try again and with experience you will know which fish to show and how to prepare them. Good luck to your efforts.

OUR EXPERTS' ANSWER TO TROPICAL AQUARIUM QUERIES

Please give us the name and culture details of a live food that can be propagated indoors to meet the day-to-day requirements of about 20 small to medium-sized fishes.

You cannot do better than cultivate the so-called Grindel worm in a warm airing cupboard, or between the cover glasses of lighting hood of your tropical aquarium. The worms can be bred in almost any shallow receptacle measuring about 8 in. or more in length. Leaf mould or peat moss kept permanently damp makes the most satisfactory culture medium. After the worms have been introduced into the soil, they should be fed every second day with about a tablespoonful of creamy Furrey or mashed potato. Keep the food lightly pressed on to the compost under a piece of glass covered with a light-excluding lid. Fed regularly, the worms will multiply rapidly and form clean masses on the glass ready for instant use.

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

About 10 months ago I set up a community tank and stocked it with neon tetras, barbisequin, gold, wargtail planes and various knots. Recently, however, the wargtail planes have disappeared. I've seen some down in the aquarium, look somewhat curbed-in and spend a lot of time mooring in the plant life. Do you think they have contracted a disease?

In all probability your wargtail planes are showing the effects of old age. Normal life span of any fish does not exceed much over 2 years, and it is reasonable to assume...
that your fish are well past their prime. Unless the other occupants of the tank worry them, there is no need to remove them elsewhere. But once they become really emaciated it is harder to destroy them.

Polystyrene bowls are cheap to buy and I have been wondering whether I could use them for keeping and breeding the smaller kinds of tropical fishes.

Yes, you can keep and breed the smaller tropica in polystyrene bowls, but as they are awkward things to accommodate in a limited space, I believe that you would find shallow, wooden boxes lined with 300-gauge polystyrene a better proposition.

I wish to make a short journey with a can of tropical fishes and would like to know a way to keep the water warm.

Normally there is very little loss of heat if you wrap the container in several thicknesses of corrugated paper or other insulating material. In cold weather, however, it is a good idea to place the wrapped can in a box containing a filled heat-water bottle.

Do fahey or water plants deteriorate in colour, size and/or number if they are raised under artificial lighting alone?

Fishes and submerged plants appear to flourish just as well under certain types of artificial illumination as they do under natural lighting.

Those give me some information about the characters called seeces?

The species seeks a head-downwards position and it is advantageous if plant life such as the regular live and dead foods. In a large tank maintained near a temperature range of 22-26°C will sometimes attain a length of 8 in. and at this size is an accomplished jumper. Small specimens are commendable, but large specimens are

I have been keeping near on some yellow nots that have taken up residence in white water box, buy up this will be the time of writing this one as I am in the possession of their numbers. Please tell me a way to get rid of them.

Leave the box unanswered for a while so that the worms can escape. Place a rolled-up piece of newspaper and pass it to and fro across the soil. That is all the chance will survive this scorch-earth policy. Those that do can be given repeat treatments.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

The fish have been put in too soon, that is before the water plants have had a chance to get established. It must be realised, however, that goldfish do like to be in the top section of a tank and normally go to the bottom only to feed. Even then, as soon as they get a mouthful of food they return green food such as money algae or purée of cooked spinach, and strong light, natural or artificial, for at least 7 hours every day.

Does provision of a fish's scales always indicate death?

No, it is certain other bacterial infections the scales stand out from the body and often slough away in patches if the fish struggles in a net. These diseases, fortunately not common, are more likely to occur and make headway in a neglected (polluted or dirty-bottomed) aquarium maintained at a high temperature thus in a clean tank kept at a temperature in the lower to middle seventies.

A dealer has some Nothobranchius for sale. Their distinctive size and shy appearance gives them great charm. Would a pair or two of these less common livebearers suit the chores of a fairly busy person, or only in a community tank?

The mummichog fish (H. formosa) will settle down nicely in a community tank housing non-aggressive fishes averaging 1 in. in length. We recommend the following as ideal tank companions: White Cloud Mountain minnows, bloodfish, Neocara anomala, neon tetras and Barbos phriani. To save any of this livebearer's fry you will need dense masses of vegetation near or at the surface of the water.

I have just bought several young Barbus fasciatus. How does one tell the sexes apart?

The sexes are much alike, but in mature fish the male's stripes are much clearer than those of the female's, and his fins are redder.

Please tell me the sort of conditions and food best suited to the livebearing half-back.

Firstly, the half-back is a surface hopper and there is no need to keep it in water deeper than 5 in. A temperature range of 70 – 80°F (21 – 26°C) suits it very well. It is not fussy about its food, but doesn't feed from the bottom. What it needs is dried food that floats for a while before sinking slowly in the water, or tiny worms dispensed from a perforated, top-feeding feeder.

September, 1962
Can you suggest a suitable book on breeding and rearing coldwater fishes, particularly the British shubunkins?

_Coldwater Fishkeeping_, 2d. 10d. post paid, is obtainable from _The Aquarist_. This book not only deals with the making, setting up and maintenance of a pond but also deals with the preparing for breeding, the breeding and rearing of the young, feeding and general care, and also gives all information on diseases and pests. The breeding of shubunkins does not involve any special method and the only points to bear in mind are the required standards for that type of fish, and you should try to breed to them.

My goldfish fry have developed the following symptoms: the fish have woe-won gills; some have reddish markings around the gills and also on the body; the pectoral fins are somewhat contracted and the fish rub themselves on the gravel. What is the matter with them and what is the treatment?

The description is a typical one of a fluke infestation. Probably the flies are _Gyrodactylus_, very tiny worm-like creatures which feed on the fish and weaken them considerably. The cure is to give the fry a bath in a solution of formalin and acid to a quart of water. Have a clean bowl ready for the fry when treated. Then place them in the solution and keep watch over them. They may dash about for a bit and then will become quieter. After 5 minutes remove them to the fresh water. Should the fry turn over before this time remove them at once to the fresh water, when they will soon recover. See that their tank is thoroughly disinfected before they are put back.

I have a fantail goldfish which has developed a lump on its side. Is it to be ill but I would like to know what it is and what to do about it. Are these lumps common in this variety?

The lump is probably a cyst. These form in many animals and are sometimes caused by a malformation of tissue. A lump may form as the result of a knock or other injury. It is impossible to make a cut in the skin and press the cyst out, but if the fish does not appear to be inconvenient at all it will be better to leave the lump alone, when it might burst and empty out on its own.

I wonder if you can identify a coldwater fish I bought at a dealers from among a batch of imported fishes. It is 4 inches long and the tail fin is rounded at the tip. The body is slender and about half an inch at its deepest point. The colour changes from a dull buff to a pink when the fish is excited. The scales are very smooth and regular. The onset is blunt and the lower jaw is somewhat downturned. I cannot find the fish depicted in any books and none seem to know what it is: can you help?

From your description and sketch I think the fish is an American mud minnow, probably _Mamaki nigripes_. There are said to be about 300 different species of the mud minnow in the United States, and I saw one of these some time ago at a Hendon show, when I was judging there, and was able to identify it. This fish had been caught in a pond where it had been kept for some time, and the fish is not native to Britain. It is quite a hardy fish but not very good in a community tank as it will attack other fishes and eat small ones.

I have 40 shubunkins from a quarter to half inch long in a 34 in. by 12 in. by 12 in. tank with three 1 in. shubunkins. The larger fish have started to go wrong, with hollow bellies and a loss of appetite. I feed no live and dried foods and give some seaweed. What is the trouble?

It is probable that most of the trouble is from overcrowding. You may be giving an amount so that the fish get enough oxygen, but this is not enough. Without plenty of space the fish will not keep healthy for long. It may be that some have flakes on them and if so you can expect all the fish to become infected. I find that although it is possible to overcrowd small fish in a tank, if they do not get more space once they are about an inch in length they seem start to fail, but a lot depends on the way they are looked after. The recommended number for your tank is 12 fish of 1 inch body length, but if the tank is very well planted and the water in good condition as many as 16 fish can be safely kept. They would probably grow quicker if they had more room. I suggest that you spread the fish and see if the condition improves. Examine for flakes and if signs signify their presence immerse them in the Demol bath as recommended above.

In my coldwater aquarium I had two catfish but one died. Before it died it lost its sense of balance and now the other one seems to be affected. What is the trouble and what can I do about it?

I suppose that you have not been sold tropical catfish in error. These would soon go off colour in cold water. Coldwater catfish are usually very hardy and are little trouble to keep. Perhaps your treatment is incorrect; check up on all points and read a practical coldwater-fishkeeping book.

Can you tell me if there is any cure for swim-bluadder trouble in a fantail 3 months old? It is now in a bowl of salt water and is on its side. It does not seem to be able to move to get at food.

It may be possible to cure this fish but whether it is likely to get the same trouble another winter is another question. These short-bodied fish are always more liable to have swim-bladder trouble than are the ordinary types of goldfish. The trouble usually starts when the temperature of the water drops to below 50°F. It can also be hastened by feeding too much, especially with starchy foods once the water cools. These types of fish can go through the winter with scarcely any food at all and be none the worse for it. One can easily recognise the fact that with such a short body the swim bladder can be seen upset if the belly is distended with food. Keep your fish in very shallow water and warmer than before, at least 50°F if possible. Provided that this is taken with the feeding during cold weather the fish may not be troubled again.

I have four shubunkins 3 inches long and shall be obliged to you if you can tell me when they will be large enough for breeding.

Your fish are already large enough for breeding. All varieties of goldfish can breed the year after being hatched provided that they have been fed well and grown on to a fair size. It all depends on their size and health. I have bred from fantails 11 in. in length but not all of the young fish may breed. Feed well with garden worms and give your fish plenty of space and they should breed.

Some of my pond goldfish have developed a few white patches on them. They just appeared about July and show no signs of fungus. The fish appear quite healthy. What is the cause of this?

If the white patches show no signs of fungus then they are just normal coloration. Many goldfish to-day show some of this silver colouring. This is probably because one of the parent fish had some silver in the strain. This will continue to crop up for many generations and even goldfish which are completely red can have youngsters with silver patches on them. It is noticeable that these white patches increase in size as the fish gets older and they may even become silver all over in time. It is not a disease and will not harm the fish in any way.

Can you tell me which are the best kinds of water plants for the aquarist in the garden pond?

You need not worry about oxygenating plants in an outdoor pond. They can help a bit but they are not as important as they would be in an enclosed tank. Water in a pond has a large area of its surface in contact with the atmosphere, where it is able to give off any foul gases and be reoxygenated. Some plants would help but a pond with no such plants could still be quite healthy for fish. You can use _Lagurus officinalis_, _Elodea canadensis_ and _Egeria densa_.

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THE AQUARIST
Spadefooted and Narrow-mouthed Toads

by ROBERT BUSTARD, B.Sc.

Although both of these toads belong to families with a wide distribution and a good number of species, only a very few are commonly available to British collectors. Hence it is possible to discuss them both within the space of a single article.

The spadefooted toads are so-called because their hind feet show adaptations for digging. They occur in Europe, north-western Africa, southern Asia and in North America. The European spadefoot (*Pelobates fuscus*) and the American eastern spadefoot (*Scaphiopus holbrookii*) are the only two species likely to be available.

The European spadefoot is a small toad, measuring about 2½ in. Above it is marked with brown or red-brown on a background of grey or brown or even yellow; below it is dirty white. One characteristic feature of this little toad is the presence of a metasternal digging spur on each heel. The U.S. eastern spadefoot shown in the accompanying photograph are attractively marked in shades of green and yellow, marbled with black. They measure about 2½ in. Their vertical pupils, indicating their nocturnal habits, can be seen in the illustration.

In nature spadefooted toads spend long periods in their burrows, which are constructed in loose ground by a kind of shuffling movement aided by the adaptations of the hind feet. Their food includes the normal toad diet of earthworms, slugs and insects, and feeding in captivity presents no difficulty as the three stand-by items—mealworms, mealworms, and bluebottles—are all acceptable. My specimens have always been fed largely on mealworms and earthworms, for if not immediately eaten, the worms may come to the surface at night when the toads are active and unteethed gullets are later consumed as bluebottles.

The vivarium for both species should contain damp soil, which should not be waterlogged. No hiding places need be provided as the toads burrow into the ground.

The eastern narrow-mouthed toad (*Microhyla carolinensis*) is the species of the family Microhylidae most likely to reach the amateur. The head is small and the mouth region certainly narrow. The total length is about 2 in. The dorsal colour is greyish olive with faint darker markings. In their natural surroundings these little toads are said to be creatures of habit rather like our common toad (*Bufo bufo*). At night they regularly forage along the same paths and return just before dawn to their home by means of short, rapid jumps. They feed on small insects, spiders, small earthworms and slugs.

My three specimens were housed in a 20 by 20 in. vivarium, which proved sufficiently large for these small creatures. Later they were put into an outdoor reptileary, where they do well, at least during the warmer months, but like the European midwife toad (*Alytes obstetricans*) and fire toads (*Bombina bombina*) are seldom seen there because of their small size. The indoor vivarium had a floor covering of 2 inches of garden soil, on which two pieces of turf were placed. These covered almost three-quarters of the floor area. In one corner a small dish was sunk into the ground to act as a pool and at the back a few small flat stones were provided as hiding places. Later I discovered that these were really unnecessary as the toads had made their homes in small burrows below the grass roots.

Perhaps the quaintest members of the family are those of the genus *Berniceps*, of which the flat-faced *Berniceps murinus* is typical. These little creatures are remarkably fat, almost balloon-like, and have very short limbs. They are most unusual among amphibians, and indeed among animals in general, in being unable to swim. They are the most ridiculous-looking amphibians that I have kept, and would undoubtedly be better known among vivarium enthusiasts but for their specialised feeding habits—their diet is mainly termites.

Specimens of these toads are likely to cost about 7s. 6d. to 1s. each.
STANDARDS of the American Guppy

The guppy has come a long way, by means of mutations and selective breeding, from the wild type Lebistes reticulatus found in Trinidad and Venezuela. As a result of extensive and highly competitive exhibitions of the improved varieties, much controversy has arisen over just what exactly is a fancy guppy. The following are the standards of the American Guppy Association for the three most widely exhibited, and therefore most controversial, types of fancy guppy.

Deltatill Guppy

This type of guppy is thought by many to be the ultimate achievement in guppy breeding. Many fish are shown each year that are placed in the deltatill class, and although many approach the following standard, few if any equal it in all respects. It is important to bear in mind when reading this and the following standards that the illustration shows an ideal fish, and that the word description is concerned with proportions and not size. It is usual to see male guppies from 1 1/2 to 2 inches in length exhibited to-day, although the wild type seldom, if ever, exceeded 1 inch in length.

Body. The proportions of the body to the caudal fin shall be in the ratio of 4 to 5 (see Fig. 1). The ratio of length to depth of the caudal peduncle shall be 3 to 2, that is, strong enough to carry the caudal fin (see Fig. 2). The body must be well rounded and neither lump-backed nor flattened.

Dorsal fin. The dorsal fin shall approximate a parallelogram (see Fig. 3). The ratio of length to depth of this fin shall be 2 to 1. The posterior margin is seldom even; it is usually fringed.

Caudal fin. The caudal fin shall approximate an equilateral triangle (see Fig. 1). The posterior margin of this fin should be even. Very few mature male guppies display an even margin; most are fringed, scalloped or frayed. In addition, nearly all deltatills have rounded corners. This fin must be spread and carried erect at all times.

Colour. Both dorsal and caudal fins should be entirely coloured, with colour in at least half of the body itself. Some strains show colour in the pectoral and anal fins, but the pelvic fins are seldom, if ever, coloured.

Fig. 1. Deltatill: proportions of length of body and length of caudal fin (4:5)

Fig. 2. Deltatill: proportions of the caudal peduncle (length to depth 3:2)

Fig. 3. Deltatill: a parallelogram and an equilateral triangle are superimposed over the outlines of the dorsal fin and caudal fin respectively.

THE AQUARIST
Guppy Association

Veiltail Guppy

This tail type was considered to be the last word in caudal-fin development 20 years ago; to-day too many of the entries in this class are culled from delta-tail strains. Most of these fish exceed the width requirements for a veiltail and cause much controversy about whether they are superior veiltails or poor delta-tails.

It has been suggested that the name "veiltail" be dropped in favour of "wide tail". The members of the Standards committee feel that wide tail would be equally applicable to veiltail and delta-tail types and therefore is not an acceptable name.

Body. The proportions of the body to the caudal fin shall be in the ratio of 1 to 1; that is, the length of the body shall equal that of the caudal fin (see Fig. 4). The ratio of length to depth of the caudal peduncle shall be 3 to 2; that is, strong enough to carry the caudal fin (see Fig. 2). The body must be well rounded and neither hump-backed nor flat-headed.

Dorsal fin. The dorsal fin shall approximate a parallelogram (see Fig. 5). The ratio of length to depth of this fin shall be 3 to 1. The posterior margin is seldom even; it is usually fringed.

Caudal fin. The caudal fin shall approximate an isosceles triangle (see Fig. 5). The posterior margin of this fin should be even. Very few mature male guppies display an even margin; most are fringed, scalloped or frayed. In addition, nearly all veiltails have rounded corners. This fin must be spread and carried erect at all times.

Colour. Both dorsal and caudal fins should be entirely coloured, with colour in at least half of the body itself. Some strains show colour in the pectoral and anal fins, but the pelvic fins are seldom, if ever, coloured.

September, 1962

Varieties of swordtail guppies
Standards of the A.G.A. (continued)

Swordtail Guppies

Before the development of the veil- and delta-tail types, the various swordtail types were very popular with guppy breeders. Although they have fallen off sharply in popularity since the advent of the wider tail types, they still rank far ahead of the many other tail types that have been exhibited. Here again, many of the swordtail guppies exhibited are called from delta-tail strains; they tend to have club-shaped rather than sword-shaped caudal fin ray extensions.

Body. The proportions of the body and the caudal fin shall be in the ratio of at least 2 to 3, and preferably 1 to 2 (see Fig. 6). The ratio of the length to the depth of the caudal peduncle shall be 3 to 2; that is, strong enough to carry the caudal fin (see Fig. 2). The body must be well rounded and neither hump-backed nor flat-headed.

Caudal fin. The caudal fin shall be long and narrow, extending well beyond the caudal peduncle. The ratio of length to depth of this fin shall be 5 to 1. The posterior margin is seldom even; it is usually fringed.

Caudal fin. Top sword: The upper rays of the caudal fin shall be elongated into a sword-like extension.

Bottom sword: The lower rays of the caudal fin shall be elongated into a sword-like extension.

Double sword: Both the upper and lower rays of the caudal fin shall be elongated into sword-like extensions of equal length.

On all swordtail types the fin ray extensions are usually club-shaped rather than sword-shaped. Breeders should strive to attain an evenly tapered sword-shaped caudal fin ray extension.

Fig. 6. Swordtail: proportions of length of body and length of caudal fin (at least 2:3, preferably 1:2)

Colour. The dorsal fin for all swordtail types must be coloured entirely. The caudal fin is usually clear except for the extended rays, but may be entirely coloured. Some strains show colour in the pectoral and anal fins, but the pelvic fins are seldom, if ever, coloured.

Other Tail Types

Many other guppy tail types exist, but the American Guppy Association experience has shown that those types standardized in this material are by far the most popular in this country. In exhibiting guppies the Open Class will allow for all other types that may be shown and judged.

Female Guppies

Female guppies are much larger and less colourful than male guppies. Many varieties of female guppies exist, but as they are not judged under existing American Guppy Association rules, no standards have been set for them at this time. The following outline could be expanded into a set of standards if the need were to arise.

Body. The body of the mature female guppy is larger than the male. The proportions are 6 to 5 in overall length and approximately 3 to 1 in volume.

Dorsal. The dorsal fin of most female guppies is small and rounded, although some strains show elongated dorsals.

Caudal fin. The caudal fin of most female guppies falls into three main types, as shown by the Figures. These tail types are not necessarily indicative of the caudal fin type of males from that strain; i.e., round-tailed females occur in many delta-tail strains.

Colour. Female guppies may or may not show colour in the dorsal and caudal fins, or elsewhere on the body and other fins. The colour shown is not necessarily indicative of the colour of the males of that strain.

Colour Strains

Colour strains refer to the background colour of the body of the guppy. The three main colour strains are:

gay—the colour of the wild type guppy; gold—a mutant colour, almost butter-yellow; albino—true albino, with pink eyes.

An Open Class for colour strains will include blonde, bronzé, etc.

Colour Varieties

Colour varieties refer to the colour of the caudal fin of...
the male guppy. In all cases except multicolour the colour should be pure, and usually extends well into the body and into the dorsal fin. The recognised colour varieties are: blue, black, red, green, multicolour. All colours occur in various shades, with preference usually being given to the most intense shade shown. An Open Class for colour varieties will include colours not specifically mentioned here, such as yellow and purple.

(Reproduced by permission of the American Guppy Association)

Fancy Guppy Association’s New Handbook

The Fancy Guppy Association has adopted the A.G.A. Standards for international shows, as a step towards establishment of world standards. All the guppy outlines shown below at the actual desired size of the fish are reproduced by permission from the Standards Handbook of the F.G.A.

The Handbook, which gives full details of judging standards and paintings, is obtainable from Mr. T. R. Hale, 22 Watford Road, Radlett, Herts., price 3s. 6d. post free.

Original female

Multicolour veiltail male

Fantail male

Delta male

Flagtail male

Wedgetail female

Superba female

Scalloptail female

September, 1962
(8) The Oranda

by

A. BOARDER

The oranda is one of the most spectacular of the fancy goldfish. In general shape it resembles a veiltail but has a large protuberance all over the head and gill plates like the head of a basin. The fish is of the double-tailed type, and the tail should be large and flowing with little or no forking. The body is very short and compact and should approach a sphere in shape. The head must have the raspberry-like growth (the hood) over it and the gill covers; the more coverage by this growth the better the specimen. Often one finds at shows specimens that have only a partial growth, and these would lose marks. The dorsal fin is well developed and should be held well upright. It should be evenly curved in front and slightly concave at first at the rear but convex towards the body. The pectoral and pelvic fins should be pointed but long. The anal fins must be double and well developed. The caudal fin should be at least as broad as it is long, completely divided and hanging in graceful folds.

Development of Hood

The colour of the self variety should be entirely a rich warm red. A variegated fish is also recognised, with two or more colours. A shubunkin-coloured fish is recognised as well and this should be coloured as for the shubunkin. I have noticed of recent years that all the good shaped orandas have been gold or red and silver. I have not seen a shubunkin-coloured fish with a good hood. The difficulty in breeding this type of fish is that the hood does not always develop on young fish. It is therefore essential that many fish should be kept for 2 or 3 years so that it can be seen if they are going to have the desired hood or not. This makes their breeding very precarious, as one needs plenty of space as well as patience to succeed with this unusual variety. The fish is not particularly difficult to keep but it does not lend itself to open ponds during the winter. The flowing finnage would then be very liable to attacks by fungus and fin congestion and so it would be necessary to take the fish inside, at least in the colder parts of the country.

The feeding of orandas presents few difficulties, as any normal goldfish food will be eagerly taken. The chief fault I have noticed in orandas at recent shows is that the tail or caudal fin is too furred. The end of the tail should be almost straight and not furred at all. Another fault is that the hood is not developed enough and so does not cover enough of the head and gill plates. This fish needs careful training for exhibition purposes as it is inclined to sit on the bottom of the tank when being judged. A frequent run in a show tank would help and a small feed of live food at the same time might tend to keep the fish more alert when in the show tank at an exhibition.

Judging the Hood

When judging this fish under the present Federation rules the judge must use a lot of discretion in assessing the value of the hood. Under the old rules points were allotted for the hood, which included the hood (20 points could be awarded for this feature alone). I consider that it was a grave mistake in making up the new rules to omit any special pointing for the one outstanding feature of this handsome fish.

THE AQUARIST
our readers

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and it is not responsible for the opinions expressed by correspondents.

Stones for Aquariums

MAY I, yet again, draw the attention of readers and contributors to the fact that few limestones will cause any harm in freshwater, cold or tropical, or British marine aquaria. Those "limestone" which will cause trouble are of such a soft texture that even the beginner will have doubts about them (i.e. chalks).

Your contributor J. R. Tingle (Keeping our Native Fishes, The Aquarium, July) condemns limestones and quartz but praises sandstone (mainly quartz) and "softs" (calcareous) and the decorative rocks purchased from a dealer. These latter usually consist of such rocks as "Westmorland" (limestones), "Devon Black" (limestones), "Cheddar Pink" (lime-tone).

Experiments with limestones, drupstones etc. over periods of several years have shown that no measurable differences occur in aquarium water contents and that none of the above mentioned rocks (other than chalks) can be faulted.

Why Mr. Tingle condemns quartz I cannot imagine, unless it be that any sharp fractures present may cause damage to the fishes (and I wonder what the actual truth is on this point, for many people use sharp-edged vein-quartz without trouble).

Please, experts, leave us our limestones, for some of the most attractive aquarium rocks are limestones and have been used in this manner "from time immemorial!"


Judges

NORMALLY I don't reply to comments or criticism on my articles in The Aquarium; after all, isn't that why we write—to promote interest? However, I feel this subject of training judges so important that Mr. Skinner's letter (The Aquarium, June) warrants a reply.

According to him I rushed into print without giving the matter sufficient thought. This is furthest from the truth, because as long ago as February I raised this very subject at the Annual General Meeting of the F.N.A.S. If this is rushing into print then we are living in a faster day and age than I realised. As to who said "Who judges the judges?" first, does this really matter so long as it is said and asked often enough?

You accuse me of asking a lot of questions and not giving the answers Mr. Skinner. The answers surely must come from the respective governing bodies, but incidentally my answers, along with my suggestions for a training scheme, were sent to Mr. G. Cooke (Chairman, Judges and Standards Committee, F.N.A.S.) months ago, but please remember it is up to you all to put forward your comments and suggestions—hence the question mark.

In all fairness, I learned while judging a show in Yorkshire where Mr. Skinner was judging, too, that he already runs an excellent scheme for training would-be judges. It was not at this type of person that my bars were aimed, rather the "'untrained", commendable for his enthusiasm but lacking in the "know how" to do justice to the fishes given him to assess.

JAMES L. KELLY, Judge, Fancy Group Association.

Aquarium Gardening

MAY I compliment you on the continuing high standard of The Aquarium, in the face of increasing American competition, and the fact that you have been able to continue publication whilst a contemporary magazine had to close down. I particularly enjoy the articles on tropical marine fishes and wonder whether it might be possible for you to include photographs of these truly exotic jewels in your occasional colour supplements. This would be magnificent publicity for this branch of the hobby and should encourage people like myself, who always mean to try marines, to finally take the plunge.

I am, however, afraid that, looking back over the years, the breeding reports tend to repeat themselves and follow the same pattern over and over again. Surely the majority of us in the hobby have many failures in our breeding attempts. I personally must have lost many thousands of fry through having infusorium cultures run out too early, power and equipment failures in the small hours, and, I must admit, neglect! I have had moderate successes, nothing wonderful, but I have never bred acronys. Most of us know or can read in the textbooks how to breed a fish but very little is said about what not to do.

I found Dr. R. O. B. List's article ("Does your back ache when gardening?", The Aquarium, August) most refreshing after the general run of—"I put a pair in a tank—they spawned—6 fed the fry on Infusoria—6 fed them on sifted Daphnia—6 took unwept dozens to a delighted dealer" type of essay. However, I must disagree with him on two points.

Firstly, the case of adding small pieces of raw liver to the aquarium compost for the sake of the plants. Now plants are completely unable to assimilate solid food of any type, let alone meat; their intake of "nourishment" is by inorganic salts such as nitrates by their roots and carbon dioxide through their leaves. Plant foods consist of relatively simple inorganic compounds which they succeed

Address letters to The Editor, The Aquarium, The Butts, Half Acre, Brentford, Middlesex.
Tubifex in a plastic holder are the cause of the interest shown by these paradise fish (Macropodus opercularis dory)

in building up into complex organic molecules. Now let us consider the piece of liver in the compost: this will partly, increasing the bacterial and protozoan populations to uncomfortable proportions. These organisms may, if we are lucky, be all harmless and only cause annoyance and irritation to the fishes, but they may equally well contain amongst their numbers pathogenic species.

If you doubt this process takes place, take a piece of liver and drop it into a jam-jar of tank water; the smell that greets you the next day has to be experienced to be believed! Although in the aquarium there is far more water involved, a given size of liver will give rise to approximately the same number of micro-organisms in the jar as in the aquarium. In fact the aquarium oxygen will be more plentiful, the temperature more comfortable, and so the bugs will breed much faster, surely to the detriment of our fishes? But, you say, the contributor gets away with it, how does he do it then? I think he is lucky enough to have a sufficient number of Malayum snails to clear up the carrion that he puts into the sand. The droppings of the snails and fishes are in turn fed on by benign bacteria who produce silt that can be readily assimilated by the plants.

Secondly, may I say that adding copper and other chemicals to aquaria is a dangerous thing to do. Some people do claim cures for velvet, for instance, with copper, but those same people have asked me how to treat copper poisoning! I am not saying that copper will cure a tank of alga or a fish of velvet, but the margin between a therapeutic and a toxic dose is only a matter of a few parts per million, if that, and how on earth can we maintain the correct dose in such a complex system as an aquarium?

But, you say again, Dr. List gets away with it; how does he do it? Well, any water in contact with copper will dissolve a few parts per million of the metal, the quantity depending to a great extent on the pH of the water—the lower the pH (the more acid) the greater the amount of copper that will go into solution. I believe Dr. List is lucky enough to have both alkaline and hard water in his tanks. The higher the pH of his water the less copper will dissolve (we all know how acids attack metals), and the calcium bicarbonate pres-

snt in his water as part of the hardness reacts with the little copper that does go into solution to give an insoluble material, copper carbonate, which is greenish in colour, discolours the paper and gives rise to the idea of copper sulphate being formed.

As for the older coins being safer this is due to their being purer copper whereas modern pennies have larger proportions of zinc and nickel. Halfpennies prove fatal because two of the coins contain far more copper than one penny.

May I also put in a plea for efficient isolation of new stock; many troubles can be avoided by this method and perhaps most important of all—money saved! Daphnia in the wild are also a source of infections and pests although they do not contain fish, they will contain eggs and newts that can carry disease, and birds often visit these pools from infected waters.

Of course we cannot avoid all diseases by culturing Daphnia at home, a difficult task in itself, but we can protect our fishes from as many as possible by resisting the temptation to collect live food from possible sources of infection.

P. CAPON
Bilburry, Exeter.

Inter-Pet Supplies Co.

The Liquity Co. Ltd. has formed the Inter-Pet Supplies Co., a division specially intended to promote sales of the Company's present products, and to provide a marketing service to other manufacturing firms in the pet industry. Only the best products available on the international market will be sold (hence the name Inter-Pet). Some of these will be marketed in their original packs and others in packs designed with the Inter-Pet symbol as the predominant theme. Any product sold by Inter-Pet will have to meet stringent tests. In general two products will not be marketed if they are in competition with each other. The possible exception to this rule is fish foods, since each aquarist has his individual preference.

Inter-Pet will take over the marketing in the U.K. of the present range of products sold by the Liquity Co. Ltd. These include Liquity, Liquistox, Pleasure, Sterapet, Gun-Wel products, Bio. Other major items are to be announced.

Mr. A. C. Lambert has been appointed Sales Manager of the newly formed Inter-Pet Supplies Co. Mr. Lambert is a keen aquarist and pet-keeper. He started fish-keeping as a hobby in 1946 after leaving the Army. He was a Founder Member of the Thames Valley Aquatic Society and is now secretary for 3 years. Mr. Lambert served as a judge for the F.B.A.S. and A.S.I.A.S. besides being an A.S.I.A.S. lecturer and acting as technical adviser at Aquarist Shows.

The Liquity Co. Ltd. was formed when several enthusiasts found that the most convenient way of feeding their baby fish was with a suspension in a liquid of minute food particles. They found this product to be so successful that it was decided to sell it nationally under the name of Liquity. Since the product was first launched in 1952, various improvements in the form, and process have been made and Liquity now has large sales all over the world.

Other products for aquarium use were subsequently developed and marketed by the Company. The directors of the Liquity Co. Ltd. are Mr. O. L. Carrington and Dr. J. N. Carrington, two qualified chemists with more than 50 years' total fish-keeping experience. The Carringtons also have retail pharmacy businesses in Surrey. In the last 9 years the Liquity business has become so important as the other concerns.

THE AQUARIST
Membemship of the Thorpe A.S. has increased to nearly 50 during the last six months. The annual dinner and dance was held on 8th September at Staunton, Fife. The address was given by Mr. R. J. Bell (Secretary). The evening was enjoyed by all present.

Mr. T. A. Martin (Secretary) presented the show card and the results of the show will be published in the next issue of the magazine.

LEEDS AND DISTRICT A.S. held their meeting for August at the Church Institute, Leeds, and although many of the members were on holiday, there was an interesting evening with a subject being discussed. The evening was occupied with a talk on tropical fishes and breeding in general. The results of the show were announced and the best exhibitors were Awarded.

THE Bedsford and District A.S. held two new shows, the first at the Bedsford County Agricultural Show, the second at the Bedsford County Show, at Peterborough. The shows were successful and well attended.

THE News Letter of the Mersey A.S. includes a letter on the preparation of water and some advice for those who are preparing for the show.

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THE British Ichthyological Society has recently appointed the following branch secretaries for their areas: Northern England—Mr. J. W. Massingham, 63, Heenege Road, Chester-le-Street, Durham; Workington, Cumberland; Wales—Mr. Evan R. Jeffries, 27, Victoria Road, Foweypool, Mon. 

AMONG the forthcoming items in the Nottingham and District A.S. programme are a lecture by Mr. Wheler on photographing fish on the 26th September, and also an open table show which is being held on Sunday, 5th September at the Glandore Liberal Club, St. Anne's Well Road, Nottingham. The result of the recent table show for Fish was 1, 2, Mr. G. Wood; 3, Mr. D. Smith. The Carp and Loach competition result was: 1st, 2nd, Mr. D. Smith; 3rd, Mr. E. Smith.

SECRETARY CHANGES

Changes of secretaries have been reported from the following societies: Middlesex and District A.S. (Mr. H. F. Laidler, 47, Princes Road, Middelbrooke, Prestwich, and Bury) and Brunel A.S. (Mr. G. R. Shona, 27, Feeder Street, Remenham, Uxbridge, Middx.)

AQUARIIST CALENDAR

18th-22nd September: Leeds and District A.S. Open Show to be held at Trinity Church Hall, Leeds.

20th September: Kingston and District A.S. indoor Casa Open Table Show. Schedules available from Mr. H. Towell, 11, Belmont Terrace, Chiswick, W.4.

26th September: Blackpool, Fylde and Lancashire A.S. annual show in conjunction with P.G.A. at Pearson School of Dancing, 97, Station Road, Blackpool.

7th October: Bradford and District A.S. Open Table Show, at Unity Hall, Rawson Square, Bradford. Schedules from Show Secretary, R. Waterman, 18, Woodhall Place, Thoresby, Bradford, J.

16th-18th October: Scottish A.S.—Annual Show at the McEwan Galleries, Glasgow. Details from Mr. K. E. Brown, 21, Radnor Avenue, Clarkston, Glasgow.


15th November: Penrith and Boys A.S. Annual Open Show, Church House, The Village, Bury. Schedules from Mr. F. Jennings, 11, Burrellwood Avenue, Bury.

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BRITISH AQUARISTS' FESTIVAL

20th, 21st October, 1962

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Manchester

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Sunday, 21st October — 10 a.m. to 7 p.m.

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- Its exclusive cup-shaped diaphragm lasts longer.
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September, 1962
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ESSENTIAL INGREDIENT
WILL NOT FOUL THE WATER

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or direct from us:—

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Telephone: EWHURST 446

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cloudiest water, destroys all algae. Harmless to fish and plants.
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1 gallon can treats 2600 gallons water
Tablets, 12 per box treats 2 gallons water

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DAPHNIA
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Ensures current proteins.
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Large Drum ... 1/6d.

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Grade A, Small Drum ... 9d.

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Large Drum ... 9d.

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Adelaide Street, Redditch, Worcs.

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* Conditioning food for adult fish.
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DORKING, SURREY.

(Also U.K. agents for Tigre Biological Laboratories, Utrecht, Holland.)

September, 1962
BUYERS' GUIDE

The firms listed are wholesalers or retailers or both in fishes, tanks, plants, appliances and accessories, reptiles and amphibia. Abbreviations: W.—Wholesale only. R.—Retail only. WR.—Wholesale and Retail. C.—Coldwater. T.—Tropical. P.—Plants. AA.—Appliances and accessories. R. & A.—Reptiles and Amphibia. E.C.D.—Early closing day.

BERKSHIRE

The Reading Aquarist
64, King's Road, Reading
Telephone: Reading 53632
E.C.D. Wednesday. R. C.T.P.A.A.

CHESHIRE

Grassby, Joc., F.R.H.S., "The Glen" Fisheries, Mobberley, Nr. Knutsford
Tel.: Mobberley 3272 W. C.T.P.A.A. R. & A.

Robert Jackson (Naturalists) Ltd.
Holly Bank Nurseries, Grove Lane, Hale
Telephone: Ringway 3011 WR. C.T.P.A.A. R. & A.

DURHAM

Metcalf, G. R.
2, High Northgate (near A.B.C. Cinema)
(On main A.l road) Darlington

Powell, M.G.
The Honey Pot
Claypath, Durham City

The Fish Bowl
Laura Street, Sunderland

ESSEX

Goodmayes Aquarium
Shalbourne Parade, High Road, Chadwell Heath

Skilton, C. J.
"Sideway", 139, Galleywood Road, Chelmsford
Telephone: Chelmsford 56878. WR. C.T.P.A.A.

HAMPSHIRE

Arundel Aviaries & Fisheries
241-243, Arundel Street, Portsmouth

Wingate Zoological Supplies
2, Market Street, Winchester

HERTFORDSHIRE

Currie, L. & Sons
Water End, Harnod Hemel Hempstead
Telephone: Water End 44 E.C.D. Saturday. W. C.P.A.A.

Wat-Pet Organisation Ltd.
66-68, London Road, St. Albans

KENT

Kingsfisheries Aquarium
138, Greville Road, Beckenham
Telephone: Beckenham 3716 E.C.D. Wednesday (all day). R. C.T.P.A.A.

Lancashire

Hornby's
Trafford Bar, Old Trafford, Manchester, 16

Latty Kemmer
11, King Edward's Building,
Cheetham Hill Village,
(opposite Woolworths, Manchester)

Liverpool Aquarium Company
23, Sir Thomas Street, Whitechapel, Liverpool, 1

LONDON (North)

Philip Caswell Ltd.
91, Haverstock Hill,
Hampstead, N.W.3

Paramount Aquarium
95, Haverstock Hill,
Hampstead, N.W. 3

LONDON (South)

Aquatic Suppliers
7, Drid of's Road, Forest Hill, S.E.23
Telephone: Forest Hill 8516 (Open every afternoon and all day Saturday). W. C.T.P.A.A.

The Juyner Organisation
(James North (London) Ltd.)
346, Lee High Road, Lewisham, S.E.13

"Our Corner"
160, Lee High Road,
Lewisham, S.E.13
Telephone: Lee Green 3571 E.C.D. All day Thursday. R. C.T.P.A.A.

South Western Aquarists
2, Glynhafren Road, Trinity Road,
Upper Toocing, S.W.17

Tachbrook Tropicals
244, Vauxhall Bridge Road, Victoria, S.W.1
Telephone: Victoria 5179 (Open all week except Sundays). WR. C.T.P.A.A. R. & A.

THE AQUARIST
LONDON (West)
Owen Reid's, Aquarium Dept.
12, Spring Bridge Road, Ealing, Broadway, W.5
Telephone: Ealing 3279
E.C.D. Wednesday. WR. C.T.P.A.A. R.A.A.

NORTHAMPTONSHIRE
The Aquarium
192, Wellington Road, Northampton
Telephone: Northampton 34010

The Pet Shop
90, Kettering Road, Northampton
Telephone: Northampton 841
E.C.D. Thursday. R.C.T.P.A.A.

OXFORDSHIRE
The Goldfish Bowl
5a, East Avenue, Cowley Road, Oxford
Telephone: Oxford 41285
Headington Pets Supplies
15a, London Road, Headington, Oxford
Telephone: London 61706 and 58673

STAFFORDSHIRE
Walsall & Wolverhampton Aquatics
46, Stafford Street, Walsall and 147, Horley Fields, Wolverhampton
Telephone: Walsall 21783 and Wolverhampton 24147
E.C.D. Thursday.

W.T. A. R. C.T.P.A.A. R.A.A.

SURREY
Thameside Tropica and The Pet Shop
Brays House, New Zealand Avenue, Walton-on-Thames

SUSSEX
Preston Aquarium
46, Beaconfield Road, Brighton
Telephone: Brighton 29028 (Open all week).

Regency Aquarium (Prop. R. A. Bassett)
49, Surrey Street (outside Brighton Station), Brighton.
R. C.T.P.A.A.

WARWICKSHIRE
The Coventry Aquarist (Prop. W. Dymond)
3, Melbourne Road, Earlsdon, Coventry
Telephone: Coventry 27272
E.C.D. Thursday. WR. C.T.P.A.A.

Fanday Aquaria
Fanday House, 120, Stratford Road, Sparkbrook, Birmingham
Telephone: Victoria 3537
E.C.D. Wednesday. WR. C.T.P.A.A. R.A.A.

WORCESTERSHIRE
The City Aquaria; Bird and Pet Supplies
(Proprietor: Mrs. M. Hamming)
34, Friar Street (opposite Union Street), Worcester
Telephone: Worcester 22005

YORKSHIRE
The Corner Shop (Prop. J. Wilde)
526, Abbeydale Road, Sheffield, 7
Telephone: Sheffield 54172

SCOTLAND
Aquarists' Rendezvous
164/166, Albert Drive, Pollokshields, Glasgow, S.1
Telephone: South 4258
E.C.D. Tuesday (1 p.m.). WR. C.T.P.A.A.

Forbes, James L. (Prop. P. R. Greening)
176, Blackness Road, Dundee, Co. Angus
Telephone: Dundee 66609
E.C.D. Wednesday.

NORTHERN IRELAND
Ulster Aquatics
15, Montgomery Street, Belfast
Telephone: Belfast 27144
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