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Living with the Fishes

SPENDING as much time with your fish as you can and getting to know them as well as possible is fine but not many aquarists would push this to the extent of living 60 days on the ocean bed to watch marine life. This is what a team of scientists plan to do next year 50 ft. down in Greater Lameshur Bay in the Virgins Islands. They will live and work inside and outside a twin-chamber pressurised laboratory to study life on the coral reefs and to see if such a long period under water can be endured. A telephone will be their only contact with above water apart from an air supply delivered by a surface ship. ‘Operation Tekto’ is an American Government venture and information on living in confined conditions will be used for planning space flights.

Training for Fish Selling

SINCE our Comment in PetFish Monthly last month on the subject of white spot disease in fish stocks on sale to the public several dealers have written or 'phoned to our office. Some were in agreement with our remarks, some were not, although what the grounds of dismissal were did not appear very clear to us. What has been raised again, however, as a result of the Comment, is a plea for a training or diploma scheme for dealers in livestock, the aquatic trade included.

Such a notion has been spoken of approvingly several times since PetFish Monthly ran a feature on Tropicarium Frankfurt, describing the participation of that organisation in the training scheme operating in Germany. It is praiseworthy that there is support and acclamation for a scheme of this kind from within the British pet trade, and if enough support for it exists it would seem to be a good thing for the trade's organisation to get going. A formal training in fish management for a dealer-to-be would do a lot to improve the state of affairs we discussed under the heading 'Plain Speaking', although even this would not solve the basic problem finally.
LETTERS

A Matter of Magnets

We have in use an internally controlled thermostat that may be of the type described in the April edition of PFM by Arpee (Personal Comment). While agreeing that it is awkward to adjust, the temperature range is within a 3 to 4°F swing. During the first days of use, we had a clanging noise develop. This was due to the magnet having come unstuck from the plastic backplate. This was restuck with a strong adhesive and has given no further trouble in about 6 months. There was a large temperature swing when the magnet was loose and the temperature range given by the manufacturer’s setting was much lower than expected. Since the magnet has been firmly fixed, only a very small adjustment is needed to alter the temperature setting.

Perhaps Arpee could check his thermostat to make sure that the magnet is firmly fixed, and if it is not, I think his defects will be put right when he has restuck the magnet. (I’m not the expert, only the letter writer. Credit goes to my husband!)

Sutton Coldfield, Warhs.

MARY LANE

Heating Dangers

I’ve been a regular reader since PETFISH MONTHLY first started publication and have always found it to be very interesting and very up-to-date with its ideas. But please—one word of warning as regards the article by Cliff Harrison on aquarium heating (PFM, April). In fairness to Cliff—if I may be so bold—he states that in certain cases careful planning can reduce considerably the cost of any future expansion for the individual hobbyist by the running of a number of tanks from a single thermostat (what are these ‘certain cases’?). We all know that dozens of aquarists do this, but how many have come to a ‘dead end’ and dead fish.

I think all writers should condemn this practice. Because in the long run this ‘reduction’ turns out to be the most costly way of running one’s hobby and one of the ways of losing newcomers to it. Certainly you can keep cheap tropicals in these tanks for some time; then you get confident and stock up with something far better; and then the worst happens and a thermostat sticks and when you come home from work to put your feet up—all your fish have boiled. Or it happens the other way round: the heater in the tank with the thermostat breaks down, the temperature goes down, too—but the thermostat is still on so your other tanks start to boil.

It can be said that this takes years to happen, but believe me it can take a lot less time than that. I was one of these people. I lost all my lovely fish through boiling by using this method. So from now on, for me, it’s one tank, one thermostat and one or two heaters. This way, if a heater breaks you may get white spot (though if two heaters are employed in a large tank even this may not happen, and anyway it can be cured).

Admittedly the thermostat can still stick in the ‘on’ position and boil that tank, but it will be that tank only and not one or two others with it. (Even this can be avoided if two thermostats are used set in series, one at 75°F and the other at 85°F. If the first one sticks, the second one will cut the heaters off at 85°F.)

Still, the point I’m trying to express is this: please, authors, tell us the cheap ways, and then tell us the cheaper ways in the long run and the right ways. Then we can make up our own minds and if anything goes wrong, we are to blame. Fish, we all know, can feel some pain; just think of those last few moments in their lives. After all, thermostats cost only the price of two or three fishes.

Brentford, Middlesex

G. M. SCARROTT

CLIFF HARRISON writes: I should like to draw attention to two recommendations made in my article: ‘... it is a false economy to make a small thermostat try to do the work of a large one’, ‘Replace equipment if its reliability is suspect. Heaters ought to be replaced every 2 years...’. If these words are heeded, then there should be no more ‘accidents’ with batteries of tanks than with those individually regulated: the fact that so many people (and shops in particular) run a number of tanks off a single thermostat is, I think, a proof of the system. Nevertheless I do welcome Mr Scarrott’s letter as adding a note of caution—particularly for those who have not had first-hand experience of ‘mass’ boilings themselves.

Backing British

It has long been a talking point when any number of interested aquarists meet at such places as open shows and society meetings that British manufacturers of aquatic equipment are letting the grass grow under their feet, even though fishkeeping is becoming a rapidly expanding hobby.

On reading the letter written by Dr J. N. Carrington, managing director of Inter-Pet Ltd, in the April issue of PETFISH MONTHLY, my feelings were ‘Thank Heaven!’ that at least one British firm has seen a potential market for British-made produce. I am sure that along with thousands of other aquarists, I wish this firm the best of luck. I am certain that British-made goods are in most cases better finished off than much of the foreign produce that is pouring into the country from all angles. May I offer one word of advice to the British producers: please make sure that ‘British Made’ is plainly seen on
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LETTERS

Continued from page 98

your wrappers and boxes. Then the aquarist, along with all other true British people, will buy home-produced goods—that is, as long as the prices are comparable with those of foreign goods.

Workhop, Notts.

Nets

MAY I add one or two points about nets that I have noted from my own experience to those mentioned by Mr W. Alexander in his article in last month’s magazine (P.F.M, May). A very small net made of closely woven material is absolutely invaluable for use when feeding Daphnia that one has either caught oneself or bought pre-packed in a plastic bag. If the Daphnia is run through the net the accompanying water is drained off and the water fleas themselves can then be well washed under a gently running stream of water from the tap before being fed to the fishes.

As the author states in his article, a net with too fine a mesh is very annoying to use because of the water-resistance it creates. Another blood-pressure raiser is to try to catch a fish in too small a net. I find that using a net at least 6 in. by 5 in., even to catch small fish such as neon, is essential to avoid bad temper in me and terror in the fishes. Smaller nets are far too easily dodged by any self-respecting community tank inmate. Large fish, such as cichlids, I don’t use a net for at all, except as a means of driving them into a large polythene bag held open under the water at the other end of the tank.

Bradington, Yorks.

Not Money Prizes!

I THINK Mr Kelly is probably right when he says (P.F.M, May, ″Transatlantic Topics″) that better prizes would attract more (competitors) to meetings and shows. But don’t let’s make the ″better prizes″ money, please. It would be nice to have prizes of equipment and the sort of trophies we have at present but I believe that if the prizes become much more than tokens then the whole emphasis of the show can become changed. We are supposed to be in the hobby for our interest in the fishes, not in acquiring a small fortune in prize monies. And what about the smaller club shows? If the emphasis is going to be placed on the quality of the prizes, then they’ll never get any competitors. It’s the quality of the fish that counts, not the size of the trophy.

Ramsgate, Kent

Hand-Spawners take Care

HAVING read the very interesting articles by L. C. Betts on hand-spawning of goldfish (P.F.M, April and May) I don’t know whether to be pleased at learning all about it or horrified at the thought of the man-handling some wretched goldfish are going to get when a lot of inexperienced fishkeepers try it. Although the author gives the greatest detail on each step I fear that few would-be hand-spawners can possibly achieve his great expertise very easily and in the meantime a lot of fish are going to be handled by people who are ″all fingers and thumbs″. To all would-be hand-spawners I would say—unless you really want to breed goldfish in a big way, don’t do it.

Information such as this seems to me only a bit short of the notes given in some books on diseases about methods of curing some conditions ″with the knife″. Few of us seem able to judge our own abilities too well. One well-meaning friend of mine breaks every piece of equipment he touches, though he’s convinced it’s a combination of faulty manufacturing and ″bad luck″ on his part. The truth is he’s just ″ham-fisted″. So don’t play about with your fish unnecessarily. (Mind you, I’m still a beginner to the hobby and perhaps over squeamish.)

Bromley, Kent

All-Glass Tanks

MUCH as I hesitate to come into conflict with Mr Straughan (P.F.M, April) I feel I must defend the findings of the members of the I.M.S.S. concerning Dow Corning sealant. Mr Straughan does not appear to be in possession of all the facts regarding the sale of this product in the U.K. Some years ago the sealant came on the market here, containing no fungicide, and proved highly successful. Later a fungicide was added as a result of complaints about mould appearing on the sealant after use. This was offered for sale on a card showing a picture of an aquarium. Then the trouble began.

Many people observed mysterious deaths in their all-glass marine tanks, and this, in part, probably gave rise to the evil reputation that marine have. The cause of this was, in my opinion, proved beyond doubt by an experiment carried out by I.M.S.S. member, Mr D. K. Brown of Marlow, Bucks. I quote from his letter: ″As a matter of general interest I carried out the following experiment recently, supervised by a colleague who is, in fact, Work’s Chemist at the firm I am employed by. Two 20l bowls were bought and placed in separate 10-gallon all-glass containers. At the same time a tube of Dow Corning and a tube of another sealant were purchased, these being squeezed out on to sheets of glass. The fish were kept in good condition for 5 days. The glass with the dried films of sealants were placed one in each container; the fish in the container to which the Dow Corning sealant was added was dead in 3 hours, the other one was perfectly O.K. The glass with the Dow Corning was removed the next day and placed in the container with the live fish. This fish also died about 6 hours later.″

Correspondence with the producers of Dow Corning sealant revealed that the product on sale in the U.K. was not the aquarium sealant (in spite of the picture), but an ordinary household sealant which was not intended for aquarium use. As for the fungicide, they said: ″With regard to the fungicide additive, we have no knowledge of its effect on fish.″ Mr Brown’s experiment has shown us the effect.

Subsequent to our correspondence, the cards depicting
White Spot on Sale

I AM an aquatic dealer and as I do not want to seem
(because of the World's Fair) I would like my letter to be anonymous. I refer to your notes (Jans, May) about dealers selling white spot to the public.

On the whole I agree with what was written but I notice that the references in the comment were all to tropical fishes. I wonder whether this exclusion of coldwater fish was deliberate, because I must say it's these that give me the biggest headaches. Imported fancy goldfish and other coldwater fishes are more often than not heavily affected by white spot and particularly for those types that do not stand a raised water temperature it is far from easy to get a sure cure. Anyone who knows how to clear the spots from a batch of a hundred or so small orfe for certain, without three-quarters of them dying in the process, would know something I for one would like to read about. Tropicals I can guarantee to be clear of white spot, but I never feel 100% certain about coldwater fish unless they have been under observation for a very long time (2 or 3 weeks is not long enough with these fish).

DEALER
(name and address supplied)

Our remarks did apply in the main to tropical fishes only, partly because the volume of the tropical trade is so much greater (as far as people who are trying to become real fishkeepers, and not merely goldfish-in-a-bowl owners, are concerned) and partly because we are aware of the very much greater difficulty involved in ensuring that coldwater fishes are disease-free. As our correspondent suggests, the lengthy period that imported coldwater fishes would need for full quarantine, together with the extra space and greater attention they need during such quarantine, hardly make them trading assets!—EDITOR.

Judging Marines—an F.B.A.S. Reply

In reply to Mr G. Jennings' letter in the May issue of PETTIE monthly,

Our Judges and Standards Committee works to encourage the showing of all aquatic exhibits to the best advantage. This panel consists of six well-known 'A' judges, who co-opt from time to time any person that it knows could be of help with any proposed drawing, standard, guide etc. on which they are working. These finished proposals are submitted to the Council, and then to the affiliated societies for approval and acceptance before publication.

A points system for Furnished Aquaria, including marines, was first published by the F.B.A.S. 6 years ago, 4 years before I.M.S.S. came into being, and this was used by our 'A' judges with success. (Only 'A' judges are graded to judge Furnished Aquaria.) After requests from exhibitors and judges this system was revised, and has now been published, and so far is proving very successful.

Marine furnished tanks are rare, and are seen only occasionally in competition, usually in the Freshwater Furnished Aquaria Classes, so the pointing system has to be such that it stands an even chance with its freshwater competitor, or exhibitors would be discouraged, and marine tanks would never be seen at shows. If they can be encouraged, and our system can do this, one day we will see Marine Furnished Classes on their own.

When we were approached by I.M.S.S. for a meeting, we met them. Only two of their members attended. They told us of the pointing system they were going to use for single fish entries, which we were expected to accept unconditionally. We said it was too involved, and that a 'five sets of twenty points' as used for Tropical Freshwater would be best to start with, adapting it in time if it did not prove effective. This proposal was turned down flat. At no time was a pointing for Furnished Aquaria mentioned.

We were then told that the I.M.S.S. could supply judges for us to recommend. Although we accept nominations from societies for judges, they must have had some experience of judging before we can give them a 'B' grading. Only after proving their ability at table shows and passing an open show test do we grade them 'A', and consider them suitable for open shows. We were unable to accept their offer; with their little practical experience, we could not even consider their judges for 'B' grading.

A. G. JENKINS
Chairman, Federation of British Aquatic Societies
Half-beaks

*(Dermogenys pusillus)*

Photograph by RUDOLF ZUKAL

Those who, like me, are addicted to the charms of English ponds and lakes are no doubt intrigued by the pike and its almost legendary existence. Its history, right from the egg to the glass case into which it all too often ends its span is full of interest, but owing to its size many of its secrets have yet to be unravelled. The unusual shape of this fish is especially arresting to many aquarists, and those who keep tropical aquaria have very few varieties to choose from when it comes to introducing into their collections anything resembling this colourful character.

It is therefore most puzzling to me why the halfbeaks (*Dermogenys*) are not more popular. Perhaps they are more attractive than they seem; they are certainly difficult to come by, but maybe this is because they are good sellers. I have heard it claimed that they are poor travellers and therefore not favourites from the viewpoint of importation, but whatever the reasons are for their scarcity I am firmly of the opinion that we should see more of them. True, their silvery colouring is not greatly exciting, and the odd bits of black, yellow and white with which they are adorned do little to raise them far from the bottom of the colour ratings. Like the pike, though, it is their shape which appeals so strongly to the aquarist who looks for something out of the ordinary which stops short of the grotesque.

Halfbeaks seldom reach more than about 2½ inches (the male is only a little over half the size of the female), and in spite of all sorts of slanders can be trusted in most community tanks without any worries. They spend most of their time slightly under the surface of the water, apparently waiting for surface-borne prey. Indeed, only when something is really wrong are they to be found more than a couple of inches deep, and if they are much lower than this you can write them off. Because of their surface-bugging habits it is as well to put them in a tank at the top of your array, as they will otherwise
be hidden. It is quite extraordinary how many aquarists are placed too low for their surfaces to be viewed from the underside, so the beholder is in a sitting position; few sights are better than a riccia-clad surface under suitable lighting, and if you have a few top-dwellers like the halfbeaks and the hatchets to add their grace, you are really getting somewhere.

Try to Select a Pair

When selecting your fish from the dealer, get a pair if you can, as they are livebearers with a challenge that not every breeder is equal to. The males have the expected livebearer gonopodium but it is not particularly contrasty as seen against the rest of the body, so look for it carefully. It is quite large but often carried tight against the underside, so a hand magnifying glass may help in the seeing of this species. The superior size of the female certainly helps in completing the pair once you have a male in the bag.

The most horrifying accounts have been written about the ferocity (sic) of the halfbeak; no doubt the fact that the lower jaw stays put and the upper one flips up when feeding makes this fish look very ferocious. In any case its whole appearance is far from friendly and there is something of the crocodile's grin about it whilst it maintains its constant watch for something to turn up. Its appetite is certainly quite prodigious (but it's good to see it tuck in, by comparison with some of those nervous nibblers!), and it is apparently quite insatiable. Unlike the molly, and fortunately for us, it suffers no ill-effects from the odd fast which we necessarily impose on our charges from time to time.

The males are the source of most of the criticism levelled against the whole species, and this is somewhat unfortunate because the battles in which they indulge are only occasionally to the death. I believe that most of the disputes are in relation to territory, and once demarcations have been arrived at, possibly at the cost of a few bent 'swords', a tolerable sort of existence can be achieved. For over a year I had Dad, Mum and Son in my main collection and only old age finally claimed them.

Breeding

With their origins in the Far East, often in tidal inlets where the salt content of their surroundings may vary within wide limits, it is not altogether surprising that the sudden transfer of halfbeaks to freshwater aquaria can present problems. Indeed, they are quite wonderful to put up with the stresses to which they are subjected without greater protest. Assuming that you can acclimatise a pair to the prevailing water conditions in your tanks, you will find them most interesting and fearless creatures who, after settling down, might well produce a dozen or so young to test your rearing skills. The parents will, after a few days, feed from your fingers, and you will be astonished at the size of some of the items they can despatch. It is not too difficult to condition them, but success over the offspring depends very much on the resources you are prepared to allocate.

The young have little chance of survival if born in the community tank; this much applies to any liveborn fish. If you decide to transfer the gravid female to one quarters you endanger the young, which often emerge malformed as the result of mishandling of the female. You can slip a breeding trap under the female and remove her after the fry have been delivered, or you can provide an exclusive tank from the outset and remove the female when the female is known to be gravid, and finally after the emergence of the young. Very few aquarists have the resources for the latter procedure, but it is a worthwhile exercise if you have the inclination and there should be no difficulty in disposing of any raised to maturity. Most of us muddle along with the survivors of a breeding trap delivery and hope to raise the apparently bouncing youngsters in the smallest of containers—plastic sandwich boxes, jam jars and the like. The poor accommodation thus afforded account for most of the initial deaths, but it will be found that the young are not as easy to rear as their initial good looks and size would lead us to believe.

Brackish Water

I had several batches of failures until I tried putting some sea salt into their water, and this made quite a difference, but even so it will be found that death regularly occur of rapidly growing specimens which seem to be in the peak of condition, and this feature is quite baffling. I have never reared very many, but I have tried really hard to provide a good and trouble-free start. This has not proved difficult as chopped white worms will be accepted at a ridiculously early stage; they have outgrown micro worm almost at birth. Growth is extremely fast, given a certain amount of luck, and you problems start all over again when the mandibles begin to develop, which is at about the fifth week.

The males then start to scrap and casualties rise rapidly only to drop off when the fish are approaching maturity when, with the territorial disputes decided one way or another, a sort of armed neutrality takes over. Certain authorities have recommended shallow and very close planted tanks for breeding this fish, and I think this might work out provided that you get the salt balance compatible with both the fish and plants. I fear the long-term effect on the latter, and wonder what ideas readers might have on the subject. It is not axiomatic of course, that salt is a prerequisite for the successful rearing of young, but I am accepting it for the condition under which I have worked, and I believe others will agree with me on this point.

Not Common

I hope to renew my experiences with halfbeaks soon, but good specimens are hard to come by, so I am biding my time. I hope that those of you who have not tried this fish will give it a go. Don't expect too much it, though, as it is not particularly long-lived and seldom catches the judge's eye. As a character it has great deal of appeal, and it is as game as the pike itself. Many so-called 'popular' fish have far less to them in final analysis, and the price is normally one of its more attractive features. There are no food, temperature or pH worries, either, for a normal community tank to exist.
The art of raising a brood of goldfish (whatever variety) can be likened to the progress of a car when it is driven off from the garage in the morning. First we warm up the engine with the choke out, and move off gradually through the gears until top and a steady speed are achieved.

Having obtained the eggs, whether by natural or handspawning methods, we come first to the warm-up period. Eggs kept at 70°F (21°C) with the aid of heater and thermostat hatch in about 4 days, and the fry will be free-swimming in a further 2 days and ready for their food. Now we move off in first gear, and our food is not Infusoria, not fine dried food or egg yolk or anything else, but brine shrimp. Every aquarist has his own method of hatching these, and instructions as to strength of salt solution, temperature etc. vary with each different brand that is purchased. A good quantity of shrimp is required for a hatching of 500 or so fry, and, as the stuff is expensive, the sooner the fish can be put on to larger food the better.

Many aquarists are forced by circumstance to feed their fry morning and evening only: this is not ideal but if there is no one else to do the job during the day, give heavy feeds as the shrimp will live for a while in fresh water, and do not hesitate to provide artificial light if the feed is in the late evening.

Second gear comes at 7 to 14 days, usually at about 10, and at this stage the fry should be moved to fresh quarters. At all times, we are maintaining at least 70°F (21°C) heat, and no harm will be done by setting the thermostat anywhere up to 80°F (27°C). If the feeding has been good, it is now easy to sort and dispose of all metallic and pink fish, which will be present by 50% total from a spawning of nacreous fish, and with any double-tailed variety they can be top sorted for division of the caudal; all singles will be thrown away. Be quite ruthless about this; the nymph goldfish will not be with us in 1968!

Now we are in third gear, and if fine *Daphnia* is available it should be fed. You will be surprised in a further week what this food and a change of water will have done for the size of your fish. More sorting should be continued; a few down the W.C. every day will allow more food for those potential show specimens.

After another 7 to 14 days, we move on again, and are now in fourth gear. The fish, which will be between ½ and 1 inch long, really look like fish, and instead of having (say) 500 in a 3 ft. tank, we have 100 carefully selected in a 5 ft. tank. Unsifted *Daphnia* is given in as large a quantity as obtainable, and this can be supplemented with good quality dried foods of a size fine enough to be taken easily. Artificial heat can be gradually diminished and dispensed with, depending on the weather conditions, temperature and perhaps the time of year.

By the time the fish are 1 inch in body length, little difficulty should be experienced in getting your final selection of fry to rear up for the rest of the summer. The real secret of success is to run the earlier stages like a well-oiled machine, and keep pushing them on through the various stages, culling out all the time until you are left with only the cream. The biological filters described by my good friend Capt. L. C. Betts in earlier articles in *Petfish Monthly* are a boon to fry rearers. As to number of fish for space available, I have set myself a rule that from the ½ inch size on, one fish per gallon of water in a small tank (i.e. 12 to a 24 in. by 12 in. by 12 in.) should be the guide, but if we are working in a larger container, more can be kept (i.e. 30 to a 48 in. by 12 in. by 12 in., not 24). Shallow water
with large surface area is of great help, so a 15 in. deep tank need be only half-filled. If there is no biological filter, aeration is maintained from start to finish.

All young goldfish will benefit by heat during their first winter. A temperature of 55 to 60°F (12-15°C) is sufficient, and one feed per day, 6 days a week. The following spring, dependent on weather conditions and water temperature, the fish can go into outside ponds for growing on, at the rate of one per 2 square feet of surface area.

Spawning the Bitterling

THE blue bitterling, a lovely freshwater fish that comes from western Europe, is a common fish but one with a very unusual way of breeding and very different from other fishes. I first became interested in this species about 6 or 7 years ago when I purchased a half-dozen adults along with some salamanders and giant Italian newts that I ordered from Somerset. They all arrived safely at my nearest railway station and in wonderful condition.

At first, I decided to put them in a 3 ft. by 15 in. by 12 in. tank to settle down and to enable me to get them into breeding condition. It was quite early in the year when I received them, at the beginning of March, and in a few weeks they began to colour up, especially the males which were showing their breeding colours. I had three males and three females and all but one were about the same size; the males were about 2 to 2½ inches in length and the females slightly larger and, by this time, swelling with eggs.

Over a period of 8 to 9 weeks, they had been conditioned on large Daphnia (red), ghost larvae, white worms, Tubifex worms, small pink earthworms that I call brandlings and a small amount of bloodworms which I collected from leaves in my net from the Daphnia pools. The males were now in wonderful condition. They displayed almost all the colours of the rainbow; the head and upper parts of the body had a rosy colour and the lateral iridescent line became emerald green. The dorsal fin became bluish with a red triangle at the top, the anal fins rose with a black edge and above the nose groups of little white lumps or spots appeared. The female in spring develops a long tube in front of the anal fin, and this is called the ovipositor with which the eggs are deposited in freshwater mussels.

I obtained two freshwater mussels. I used a 24 in. by 12 in. by 12 in. tank for spawning, with a 2 in. layer of deep red or brick-coloured builder's sand at the bottom, and this had been boiled and well washed. Before introducing the mussels I inspected them. Where the shell seems to be hinged there are two openings on the top side; just visible is a slit and next to that is a larger opening. These are for the flow of water through the gill cavities, and the mussel feeds on small particles filtered from the water by the gill apparatus. The mussel serves as an incubator for the fish's eggs, which are quite large, more oval than round in shape, and slightly yellow in colour.

At the time of spawning, the water temperature was 65° to 67°F (19°C), the water was neutral to slightly acid and in the centre of the tank were three large clumps of Fontinalis with some large Vallisneria at the back. Near the front were small bunches of Myriophyllum and right along both ends were young giant Sagittaria. On the top were floating three medium Indian ferns. Four teaspoonfuls of rock sea salt had been dissolved in the water. The tank was placed in the recess of a room, near the window, and it just caught the morning sun on the front glass.

The ovipositor tube on the females when I first noticed it seemed to protrude from the belly about ½ inch but eventually it reached about 1½ to 2 inch in length. I put two pairs with the two mussels in the tank. At the first sign of spawning the male was seen to be round the top of the mussel, which had one end projecting out of the sand. The male fish seemed to be looking for the opening at the top. After quite a display, round and round the mussel and on top, the chasing and spawning began—to my delight on a day I was there and able to watch the proceedings. After quite a while, with the male trembling side by side with the female, suddenly the female swam down over the mussel and inserted the tube into the opening on the mussel, forcing the eggs down through the cavity.

Over a period of days the ovipositor became smaller, and then again reached full length and spawning recommenced. The eggs remained in the mussel for a period of 3 to 4 weeks, quite safe and sound and cared for. When finally they were released by the host to enter their new world, the baby bitterlings were about ½ inch long.

In my experience the blue bitterling spawns once a year, in the spring, and if they do it at any other time of the year then I never managed to see this. Before spawning time the bitterling are a shining silvery colour with a faint blue band near the base of the tail.

For the first 3 weeks, the fry were fed on a diet of brine shrimp, micro worms, sifted very fine Benmex, and the yolk of hard-boiled eggs. Then Grindal worms and fine sifted Daphnia were given and, after 5 weeks, fine Cyclops, which that year were in abundance in one of my pools. Then as the fish began to take shape and look more like replicas of their parents they were able to take small white worms and Tubifex worms. After I had weeded out the runts and weaklings, the spawning totalled 68 good fish—not a big batch, but enough to keep any aquarist interested and happy. To me this experience of spawning the blue bitterling with the freshwater mussel was very unusual and a baffling experience.
Grey Mullet in the Aquarium

By JOHN B. CLARK, B.Sc.

In recent years marine fishkeeping has received a well-deserved boost in popularity. To-day there are many shops that stock marine tropical fishes in quite a wide variety, and there are many books which tell us how to look after them, and yet we still seem to know very little about our own native marine fishes.

We have amongst our British fauna a large number of marine fishes that can be kept quite successfully in the aquarium, and many of these are also suited for tropical community conditions, but there is very little written information on the subject. Most of the popular books on British marine fishes are of very little help and are mainly aimed at anglers. In many cases the information given is incorrect, as also are some of the drawings. Mistakes seem to have been copied blindly and it is quite obvious that many so-called authorities have never seen their subjects.

I shall try to give a little relevant information on a small group of British fishes, the grey mullets. Small specimens of these are excellent aquarium fishes and are ideal for the beginner learning the ways of a marine aquarium before graduating to the exotic and expensive. The well-established expert will also find them ideal, because they perform so many important functions in the aquarium that few other fishes can do with such efficiency.

Throughout the world there are more than 100 species of grey mullet, over half of which belong to the genus Mugil. Most inhabit tropical seas but there are a few temperate species. From British waters at least three species have been reported: Mugil labrus (thick-lipped grey mullet); Mugil ramada (thin-lipped grey mullet); Mugil auratus (golden grey mullet). M. labrus is by far the commonest species.

These fishes all grow to a fairly large size, 2 feet or more. They are fished for commercially and are frequently seen on the fishmonger’s slab (incidentally they are excellent to eat). In the past, they have been specially cultured in artificial ponds to supply the tables of noblemen in the Mediterranean region.

Grey mullet are not closely related to red mullet. They are, however, quite closely related to the sand smelt (Atherina), with which young specimens can easily be confused. The major distinguishing character is that grey mullet have four spines in their first dorsal whereas sand smelts have more than four.

Unfortunately there is little variation between the different species of grey mullet and hence little satisfaction would be gained from keeping together more than one species. In any case one would really need to be an expert to identify the different species with certainty, but, not to worry, they all mix with the greatest of harmony.

All the British species are the typical fusiform fish shape with a wedge-shaped snout terminated by a broad mouth which cannot be opened very wide. The lower jaw bears a central peg which fits into a socket in the upper jaw. The lips are well developed and are used extensively in feeding. All the fins are of moderate size. The pectorals are set high on the body and tend to point upwards. There are two dorsals, the first of which is spiny, with three spines all arising together at the anterior end and the fourth weaker spine sets a little farther back. Most of the time the first dorsal is folded and fits into a depression on the back, giving a streamlined contour. The background colouring of these fish is mainly silver grey. Dorsally on each side there is a prominent greenish or golden iridescent stripe and the flanks are traversed by longitudinal stripes produced by a dark spot on each scale. Not quite as attractive as many of the tropical marine fishes, but never the less a very useful fish in the marine aquarium and exceedingly easy to keep.

In any marine set-up there should be room for a few grey mullet, since they are one of the best marine scavengers that one could ever find. Constantly in motion, they flash up and down sampling anything that might be edible. This includes cleaning rocks,
plants and glass in loach fashion and also the bottom sand, which they take into their mouths and meticulously sieve out of organic debris, by using their elaborate gill rakers and then expelling the cleaned sand. Under natural conditions they are a bottom-feeding fish but they readily take dry food at the surface. They will also take any live food provided that it is small enough. A 2 inch fish has difficulty with large Daphnia but with a small shool of mullet even the largest morsel of food that escapes the attention of other fishes is systematically shredded between them until all is devoured or some other fish notices that food is still available. Consequently uneaten food never has a chance to accumulate, which is of prime importance in keeping marines.

Tolerance of Oxygen Lack

Anyone who has kept marines will know that sometimes there are tremendous fluctuations in bacterial numbers, resulting in a very rapid lowering of pH and oxygen content. More often than not this is caused through uneaten food but there are many other reasons. Often one realises too late that something is wrong and within a few hours a tank full of expensive fishes can be dead. This is one of the hazards of keeping marines, and it has resulted in many people giving up or not starting to keep marines.

Grey mullet are typically coastal fishes and therefore run the risk of being trapped in tidal pools by the ebbing tide. Unlike the open oceans these smallish bodies of water can rapidly change their temperature, salinity, pH and oxygen content, while the tide is out. Grey mullet also frequent estuaries and even penetrate into fresh water at times. These fishes can and do tolerate very changeable environmental conditions. Like rock pool fishes, and also the majority of freshwater fishes, they possess a mechanism for coping with foul conditions. The commonest mechanism in littoral fishes is simply to leave the water temporarily and utilise the atmospheric gases. No doubt they would probably prefer to do as mullet and the majority of freshwater fishes do, which is to surface and mouth the atmosphere, but unfortunately most freshwater fish lack a swim bladder and would use a lot of energy staying at the surface, thus defeating any benefit gained.

Most of the tropical marine fishes which we can buy in this country come from open waters where conditions are rather stable and thus they do not need to be able to fight adverse water conditions, and many cannot. When oxygen is lacking few tropical marine fishes will rise to the surface to mouth the atmosphere. If they do their efforts are generally feeble. Most seem to grin and bear it, perhaps hoping that the stupid idiot staring through the glass at them will do something before adding them to his (or her) obituary.

Grey mullet, probably because they are a very active fish, are soon affected by an oxygen deficit and rise to the surface, still swiftly swimming around, and mouth the air long before conditions have grown serious for most other fishes. Incidentally they will still be swimming around, long after all the other fishes are dead! So efficient is their adaptation that in the past I have had them swimming around in putrid water containing rotting seaweed, which proved to be of pH 6·2. This is not my normal method of keeping fishes and only arose accidentally while I was on holiday, but it does exemplify their durability in foul conditions beyond any trace of a doubt. Could any other marine fish live up to this?

As far as temperature requirements are concerned, the British species are not fussy. They thrive equally well under cold water or tropical conditions. Owning to a leaky thermostat which short-circuited I once had these fishes survive the ridiculous temperature of 117°F, which killed a lot of tropical marines fishes. Although they are temperate fish, they do seem to enjoy warm conditions. My fish are kept in a tank with tropical marines at 68°F (20°C) and during the night their favourite resting place is huddled above the heater.

The British species are also indifferent to changes in salinity. Anything from neat sea water to fresh water will suit them, but they do not thrive very well in completely fresh water, tending to become rather sluggish and pale in colour; however, a small quantity of salt soon 'perks' them up.

During the night grey mullet rest just above the bottom, usually grouped together head to tail. Although they do not move bodily in the water in this condition, their pectoral and caudal fins are continually in motion and the tail half of the fish is always folded around the side of the body in a most awkward-looking fashion. If the lights are switched on it takes them a good 10 minutes or more to wake up, provided that they are not otherwise disturbed.

Although mullet are not likely to attack other fishes they are rather prone to have their own fins nipped. This takes place mainly at night, probably when they are sleeping. During the day they seem to have enough speed to escape from aggressive characters. The favourite morsel seems to be the lower lobe of the tail, which gives them a very shark-like appearance when it has been reduced. Luckily they are very fast to regenerate damaged fins.

Fungus Infection

These fishes seem to be immune to marine 'white spot' disease, since I have never found a specimen with this ailment, even when the rest of the fishes in the tank are heavily infected. They are very susceptible to fungal infections of the body and fins, and parasitic copepods, both of which may result in the loss of scales. Both these infections are easily cured by a simple freshwater treatment by placing them directly into fresh water (if they are kept in sea water) and keeping them there for 2 or 3 days. The fishes can survive this rather drastic change but the infective agents are killed. A fish in very bad condition may not be able to stand this treatment and it may be necessary to add some salt (or sea water) to the fresh water after an hour or so to relieve the stress. One can use judgement as to whether this will be necessary or not by the reaction of the fish. After 2 hours a fish has normally quite well adjusted to the new conditions. Alternatively methylene blue or potassium permanganate can be used in fresh water or

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Suckermouths, Whiptails and Twigs

By BRAZ WALKER
Photographs by the author

Perhaps the strangeness of the loricariid or sucker-mouth catfishes is a major factor in the great popularity of the group, for with few exceptions, a homelier bunch of creatures would tax the imagination of a would-be designer. Clad in ‘armour’ as are the callichthyids, they are indigenous to South America although through accident they have also become established in certain warm waters of Florida and Texas (one or two species).

Certainly a part of their attractiveness lies in the fact that most of them at least partially earn their keep by continually going over the plants, walls and rocks of the aquarium with their rasping sucker lips attempting to glean every possible scrap of algae from its anchored position. Aside from helping keep the glasses polished, after feeding time the larger species such as Hypostomus (more familiar as Plecostomus) effectively vacuum the aquarium floor.

Among this group of mostly weird-looking and bulky fishes, it is a bit surprising to find that in the genus Otocinclus there are several members which not only are limited to a reasonable size for the average aquarium but are also quite acceptable and even attractive in appearance. The little dwarf sucker catfish, Otocinclus arnoldi, is perhaps the most handsome of the entire family as well as the most diminutive. Simplicity of colour and pattern when tastefully employed are every bit as pleasing and much more endurable than splashes of bright colour, and this is a striking example of what can be done with olive green, black and white. The ceaseless energy of this smallest loricariid in his relentless search for algae, and the bold black stripe along his sides, call attention to O. arnoldi in spite of his tiny size. Once the fishes are established, the longevity of this and other Otocinclus species is quite good with one or two exceptions.

Several species of Loricaria are sold as ‘whiptails’ and are also more suited to the average aquarium than some of the less delicate and larger suckermouth catfishes that remain to be discussed. Looking somewhat like Hypostomus (Plecostomus) that have been stretched on the rack and underfed, among the Loricaria species are those which have been successfully bred in captivity. As with the other larger loricariids, caves in the aquarium are appreciated and may be the sites selected for spawning.
Male parents are reported to assume babysitting duties until after hatching. Some Loricaria species and the rather similar Loricarichthys propel themselves over the bottom of the aquarium with an odd backward or forward 'hopping' motion, which is accomplished by pushing off the bottom with the relatively powerful ventral fins.

Oddest of the group, and unfortunately the most difficult to keep in the aquarium for more than a few months at a time, is Farlowella, the twig catfish. For survival in the predatory world of South American jungle streams, one of the most often employed devices is camouflage. Although almost any edible substance will be eventually consumed, hardly a less appetising tid-bit could present itself to a predator than a waterlogged stick, which is exactly what the twig catfish resembles with near perfection. Without movement, it would be virtually impossible to distinguish a twig catfish in a pile of brush. In the unlikely event of his discovery, Farlowella is capable of short dashes which will usually get the fish to safety. Green algae seems almost essential for the welfare of this fish although dried dog foods, which have been pre-soaked, are sometimes accepted.

There is probably no other fish reaching the size of the creature most often referred to in both literature and speech as 'Plecostomes' plecostomus' that has been kept by so many tropical aquarists. There are several reasons for this, not the least of which is the ability mentioned above of this and other large suckermouth catfishes to do a reasonably good job of algae control. Since the problem of these tiny aquatic plants growing when and where they are not wanted and giving the entire aquarium an untidy appearance is one of the foremost nuisances facing the aquarist, obviously a fish whose major sustenance in Nature is algae and which is capable of removing it is a valuable acquisition.

This entire genus of suckermouth catfishes has been represented more often than not in both aquarium literature and ichthyological literature under the wrong name. The name Plecostomus, although the first name used for the genus and one that would ordinarily be retained for this reason, has been declared invalid along with certain other names of Gronow, who had usually been credited with originally naming the genus. The correct generic name is instead Hypostomus, and the most common fish of this genus is, in fact, Hypostomus plecostomus. Because of its wide range from Panama southward through the Amazon region it is also the most commonly seen aquarium species.

Certainly another substantial reason for the great popularity of these creatures is their weird, reptilian appearance. As they slide their armour-plated bodies over the aquarium floor or simply lie motionless on the bottom or perhaps perched atop a rock, one almost feels at times that he is somehow peering back through the eons of time when life was younger and the very earth trembled beneath the footsteps of some of her inhabi-
Although most commonly known as the 'plec' catfish because of its commonly applied generic name *Plecostomus*, this catfish should be known as *Hypostomus plecostomus*. The 'plec' it will probably remain to aquarists!

tants. As a matter of fact, the loricariid catfishes are a rather ancient clan, and Man would do well to walk the earth for a comparable span of time.

For the average fishkeeper, however, all this would not make acceptable a fish that may grow to a length of 12 inches in the aquarium and twice that in Nature unless the fish concerned was a mild-mannered creature which would not molest his smallest tankmate. Members of the genera *Hypostomus, Xenacara, Ancistrus, Paracheirodon* and others of the larger loricariids will do little to bother the other inhabitants of the aquarium except for occasional fights among themselves or perhaps a rather clumsy and harmless charge at another fish that might be considered competition.

*(To be continued)*

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**Grey Mullet**

*Continued from page 108*

dilute sea water. Copper sulphate should not be used since they are very susceptible to copper poisoning.

Grey mullet are not often seen in the shops, but periodically they can be sometimes obtained from commercial sources. The easiest way of obtaining them is to go and collect them. From the middle of summer to the end of winter small specimens are often found trapped in the larger rock pools around most of our coast. In summer they appear as small fry about ½ in. long and by the end of winter they have reached about 2 in. long. Occasionally larger specimens are found, about 4–5 in. long, which represent the previous year's generation. Whenever they are found they are quite numerous since they are a shoaling fish.

To catch them a large net is required and a little patience. This is not a fish which one chases to catch. They move fast and are good at hiding. A sudden movement will result in a shoal dispersing in all directions, making it very difficult to select a single fish to follow and net. The best method of catching them is to leave a large net immersed in an area that a shoal is known to frequent, wait quietly until they assemble over the net and then raise it slowly until near the surface, when it must be lifted well clear since when first trapped they try to jump over the sides of the net but soon resign to their fate.

This habit of jumping over a net is troublesome in commercial fishing since once one fish leads the way the rest follow. In the past this trouble has been overcome by sprinkling straw on the water inside the net and the fish try to jump over the straw, thinking that it is the edge of the net and in doing so expend their energy.

The fish can be caught quite easily during the day, but I prefer to catch them at night, going armed with a strong flashlight, when they can be found in groups in the deeper parts of the pools in their static sleeping posture and they can be netted more easily.

They travel very well and require only a small quantity of water. They settle down very rapidly in the aquarium and will start to eat dry food within minutes of introduction. At first one would think that their appetites are insatiable since they will continue eating as long as food is available and will rapidly put on weight, so one must learn to limit their daily intake, since fat fish do not make good scavengers. In a community tank it is advisable to add all the food necessary in a large quantity and not in small amounts, hoping to satisfy the mullet first before feeding the other fishes, since they are always the first to the food. Placing all the food in a single container allows the other fishes to get their share before the mullet can devour it all.

I have kept mullet for some time now and although they are not the most beautiful of fish I would not wish to be without them.
What's New?

At the Trade Fair

THIS month 'What's New?' reports on what was seen of aquatic interest when PET FISH MONTHLY visited the Pet Trade Fair held in Harrogate at the end of April. This annual event, organised by the PET STORE TRADER, is internationally recognised as the leading trade display at which manufacturers and wholesalers bring out their latest lines to attract buyers of all nationalities.

However, such a description does not hint at what a colourful and pleasing display the Fair always is, for considerable professional exhibition ingenuity goes into it. Just to note one display item seen this year, a young lady colourfully attired in avian fashion was captive inside a large spherical cage suspended above one (non-aquatic) stand. If the aquatic trade stands did not make an impression of quite the same kind, nevertheless they still had plenty to whet the aquarist's appetite.

Inter-Pet used a giant imitation aquarium frame on their stand in which to show their stainless-steel Metaframe tanks, and in addition to the new range of their own aquarium Remedies they were displaying a new range of air pumps called 'Happy'.

Hydro of Denmark had a colourful display of attractively packaged lines, Mr Joe Grassby, in attendance as the British agent for this firm, told us that despite devaluation very few Hydro items have increased in price. New items on show included a V-shaped breeding trap, a 'five-way' breeding trap and a new strengthened version of the well-known Junior Bottom Filter. Polyester filter wool and extra large coils of clear plastic air line are now being marketed by Hydro.

Some new air pumps in the cheaper ranges were to be seen on various stands and we were interested to see that a familiar better-class pump—the Perma—now has a plastic body and has been reduced in price. W. Ellison & Son Ltd were showing a Peto-Pet garden pump, a submersible plastic-encased pump capable of providing both fountain and water cascade for a pond. We reported seeing the Reciprotor air pump at the Fair last year and commented in PFM on its enormous air output and futuristic appearance. However, it did not appear on the trade scene subsequently and this year it was being demonstrated by South Coast Aquatic Nurseries. This pump is used in hospital work and its application for the aquarist (with a lot of tanks and a long pocket!) is an incidental one. SCAN had the full range of Eheim filters on view, including the extra large capacity ones recently introduced that have come to be described inately by aquarists as the 'dubbin' models.

New in the Rena range, also on show by SCAN, is a combined heater-thermostast, available in various lengths, wattages from 50 to 200. All-plastic aquaria in large sizes were displayed by several makers. The well-known Arbe range was there and two newcomers to this field were also exhibiting. One is the Ava plastic aquarium, in several models and sizes up to 36 in. long ready for living-room installation, complete with a large range of built-in equipment, including a filter that does not intrude on the underwater visual scene, and with all wires etc., out of sight. This really is an attempt to offer push-button aquarium-keeping in more a decorative mode, and the makers claim that the specially designed front panel of this tank reduces obscuring algal growths to an unprecedented degree.

Less elaborate but also designed as an eye-catcher is the Aqualite plastic aquarium from the U.S.A., shown by Thomas's Ltd (Petcraft). This aquarium is egg-shaped with bulging plastic viewing sides and set within a rectangular plastic frame that supports it.

The Jewel Aquarium is still new enough and worthy enough for a note to be made of its presence at the Fair, shown by John Allan Aquariums, who were also demonstrating an ultraviolet water filter for aquarium use. The bevelled frame of this tank with its pleasant anodised finish is another successful attempt to fit the aquarium for a place in the modern home.

At a large show such as the Pet Trade Fair, it is easy to miss small items worthy of note amidst so many, but one piece of equipment that did draw attention was a new design of aquarium thermometer. The stem is disposed horizontally when the curved plastic block (about 3 inches long) contains a viewing window fixed to the inside of the aquarium glass by means of a sucker. The scale has both Fahrenheit and Centigrade markings and the thermometer is made of British manufacture. It is marketed by Supa Aquatic Supplies.

In the same way, it would have been a pity to have missed a discreet little item being used by Lee Reid & Co. to demonstrate their aquarium-making skill. This was a small angle-iron tank forming with its metal cover the shape of the letter M. It held water and fish. Work out how you would glaze a frame of that design, let alone how to cut it and weld it! A completely new range of aquarium accessories under the trade name Nuova was on view on the stand of Tradefish (Aquarium) Co. In addition to such items as a set of plastic sieves for use with dried foods and live foods, a brine shrimp hatcher, an air-operated 'vacuum' tank cleaner, a special shrimp hatcher, and an underwater filter that can be used at the side of the tank with the output pipe connected to the air behaviour unit attached (the Multiplus), the range includes two large capacity outside filters and a third powered Turbo-filter with a filter chamber holding nearly a gallon and a throughput of just under 50 gallons an hour.

A good many people would be amazed to see the full range of items and services being provided today for the owners of all kinds of fish and pets, and the worldwide growth of fish-keeping is reflected by the great expansion in number and types of aquarium appliances. These represent a considerable proportion of the pet trade's interests and it looks as if manufacturers are out to meet every possible requirement of the aquarist.
PETFISH MONTHLY visits

Mr. T. Denis Smith
(BRENT AQUATIC SOCIETY)

WHEN is an aquarist’s fish house his society’s fish house? When the fish house belongs to someone as enthusiastic about his club as is Mr T. Denis Smith, chairman of Brent Aquatic Society. For his collection of fishes is housed in a converted garage right next to the meeting place of Brent A.S., and what more natural that much of the members’ fish talk should go on under their chairman’s hospitality and that this should be the Society’s headquarters?

Mr Smith is well known on the show scene, for he has had many successes in exhibiting at the major shows, including those well outside the London area, such as the B.A.F. at Manchester. I first saw a collective display of some of his specimen large fishes at the Convention of Hendon A.S. last year. Mr Smith was anxious to warn me that I should not expect to see a fish house devoted entirely to ‘monsters’ species. For although his large specimens are the ones most often talked about he disclaims the title of ‘a big-fish man’, and indeed I found plenty of evidence when I visited his Dollis Hill fish house to show that his serious interest is in relatively smaller fry.

Large tanks predominate, however, even for housing the catfishes (Clarias) and his colourful guppy strain, both in 6 ft. by 2 ft. by 1 ft. tanks, that are his real specialties. The three enormous giant gouramis (Osphromenurus) that Mr Smith regards more in the way of pets are bound to steal the attention of a new visitor. Two females and one male, these fish are in two 6 ft. by 2 ft. by 2 ft. tanks, the male separate from the others. Fighting breaks out with this trio when the sexes are mixed so there has been little hope of breeding.

The other big fishes (these have just got to be mentioned first!) include a fire eel that had threaded itself through a pipe about 11 inches long in its tank, and in this pipe it could conceal neither its head nor its tail. Its estimated length is about 14 inches. A fish of about the same length is Mr Smith’s arowana, a fish oddity whose attractiveness grows as its size increases. However, these did not show the pet dog-like behaviour of the gouramus!

In another tank a pair of Pelmatochromis hybensus were looking after eggs and elsewhere were some pirañas, including a red (nattereri) in fine colour. This 5 inch piranha shared its tank with guppies and platys, in which it showed no interest whatever and the livebearers in their turn show their lack of concern at their gaudy and fearsome-looking tank-mate’s presence by continuing to produce regular broods of fry.

Mr Smith has fluorescent lighting fitted above the tanks and power filters and undergravel filters are used. His fish house is a decorative one, its internal construction concealing its garage ancestry very well. Whilst I was being shown round by Mr Smith we were joined by Brent A.S. show secretary Mr Alan Benson, who told me something of the growing membership of the Society, still in its inaugural year, and of the interesting spectrum of professions...
A view of one side of Mr Smith's fish house. The lower distant tank is 6 ft. long

of the members, who include a doctor, a Member of Parliament, a solicitor, a schoolteacher and a priest.

It has been a policy of Brent A.S. to try to attract new aquarists and unattached aquarists to their ranks through publicising their activities in the local and aquatic press. At the time of my visit the Society had over 20 student members enjoying the experienced help and tutelage available to them from the experienced members.

With regular contact with the practical example of their chairman's impressive collection at their headquarters it seems certain that Brent members will set their standards high.

ANTHONY EVANS

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MARINE FORUM

THE Place for Ozone

By GERALD JENNINGS
(International Marine Study Society)

THE use of ozone has been debated ever since its introduction into the U.K. I must admit that personally I am not in favour of its indiscriminate usage by the marine aquarist. Where diseases curable by ozone show themselves, or in quarantining new fishes that may be suspect, by all means use it—but why use it on a well-established and running community? You may answer—to skim proteins, but high-pressure air from any powerful pump run through a skimmer will give equally as efficient a service and is far safer, too. The I.M.S.S. have received numerous enquiries relating to the use of ozone and, as a result of these, the Society conducted its own survey on ozone used by its members. Only about 15% had ozonisers, and of these only about 3% were in favour of its constant use.

- THE Americans always have been ahead of us with regard to the keeping of marine fishes (and are probably second only to the Germans with their techniques), and a pioneer in the American field is R. P. L. Straughan, editor of SALT WATER AQUARIUM MAGAZINE. 'Bob'

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Personal COMMENT

by ARPEE

In the April issue Mr L. C. Betts' article on the subject of hand-spawning goldfish included some very interesting information on the matter of accelerating the hatching of the resultant eggs. He revealed the comforting fact that the period between laying and hatching can be reduced by artificial means from some days (according to local temperature) to 4 hours. He did not say at what temperature this took place, but it must have been on the high side, even seen through the eyes of the tropical enthusiast. This leads to some speculation. I wonder whether there is any long- or short-term ill-effect on the constitution of the adults or any evidence pointing this way, since there are authorities who have warned against accelerated hatchings of certain tropical fishes on the grounds that malformed fry and weakly adult stem from this treatment.

So far as malformities are concerned, I can only positively point to angel fish, where a proportion of most hatchings consists of grotesquely formed little creatures which rapidly succumb to the needs of life. I have often pushed the temperature up in an effort to bridge the seemingly endless gap between laying and hatching, because I’ve usually the most critical part of the existence of a fish in artificial conditions; I cannot honestly say that the rise in temperature has had much effect on the level of disfigurement, but on the other hand it has not usually achieved much by way of bringing about notably better hatching results. I have hatched angel eggs at room temperature (60-65°F; 16-18°C) with similar characteristics, but there must be some truth, I suppose, behind the rather alarming accounts we sometimes read about the penalties of accelerating the natural process past a given point.

Other egglayers with which I have experimented generally seem to give rather better levels of hatching if the ‘recommended’ temperature is exceeded by 5 or even 10 degrees. I will push the odd batch past this during the next few months and record anything significant.

One of the reasons for my interest in Mr Betts’ article is a purely personal suspicion that goldfish are not as robust as they used to be. It could well be that those I have kept in past years in a climatically kinder part of the country than that in which I now live were subjected to fewer winter strains than those which have been in my care since moving to the Conswolds. Or it could be that the cult of the better-looking fish, and on mass-produced lines, has created what was sought, but that Nature has taken payment in the form of lowered resistance. I don’t necessarily think it wrong that this might have happened, but if there are any indicators that there is a tendency this way, it would have been nice to know, so that adequate precautions could be taken.

After reading Mr Betts’ article I did get a bit of a feeling that he was permitting the existence of many fry which natural selection would have eliminated very early in their existence because of individually varying constitutional deficiencies. The fear of breeding basically bad fish which look good must be present in the mind of every raiser of the calibre and integrity of Mr Betts, and I should be most interested in his and other opinions as to how this is reconciled in practice. Quite clearly the first principle that only good stock will throw good offspring is a sound one, and, equally, hand-spawning quickens up the process of eliminating what is manifestly bad. What it does not appear to do is to reassure us that the evident gains are not being offset by invisible losses. In the case of tropicales there appears to be a good case for raising temperature during breeding periods within reasonable limits, but to bring about a hatching of zebras within 2 hours would seem to me to be a normally totally unnecessary undertaking; in such a case, however, the constitutional effects could be studied over a year or so and fairly reliable data assembled, but the more leisurely life of the goldfish would seem to make a similar analysis a more difficult exercise, and I should really be most interested to know to what extent such has been attempted.

If somebody comes along and asks for advice about setting up his first tank it is very much on the cards that his questions will range widely over the subjects of fishes and equipment, but that plant life will be taken more or less for granted. It is something of a shock for him to learn subsequently that some of the apparently insignificant trifles in this particular department can vary in cost between a few pence and a few pounds. Whilst most of us necessarily give those in the latter category the go-by, the plant bill can get quite embarrassing if some of the basic principles in furnishing a tank are either not understood or ignored.

In the first place, the purpose of the tank must be determined; that is, whether it is to house a collection, to act as a spawning area, or a container in which to raise fry. The main tank of a collection will naturally attract all the specimen plants we can afford, and as these will cost perhaps an average of 2 to 3 shillings each they should be given every chance to get their roots down into the planting medium and to adjust themselves to the prevailing lighting and chemical environment. It is important for the beginner to accept the fact that some plants never will settle down in his tanks, and I am afraid that experience has taught me that trial and error, costly though it is, is the only way of proving conclusively what will grow in a given tank and what will simply fade away.

There are certain broad tendencies—such as that Cryptostegia will do better in poor than in brilliant light—but the laws which apply to terrestrial plants do not seem to hold good so consistently with those which grow under water. A number of plants commonly
I have recommended elsewhere that when permanent plantings are intended, the tendency should be to overstock, rather than the reverse, in order that plant life of the higher orders may attain an ascendency over lower forms. Fish will, of course, take care of themselves when they are subsequently introduced. Breeding tanks require no plant life, generally speaking, unless the fish involved are those which may with safety be left with eggs or young. In rearing tanks taste differs quite widely, and some advocate plants, some do not. I think it all depends on whether you are raising fish commercially or just for fun. In the former case there will not be the time or the margin to allow dabbling with plant life, but the amateur often wishes to rear young fish in attractive surroundings, and few things look better than healthy shoals moving around a well-planted tank.

It is often forgotten that many growing fish include a surprisingly high proportion of vegetable matter in their diets, so fine-leaved plants will probably suffer defoliation if entrusted to certain voracious varieties. I recently put a clump of Canadian pondweed into a rearing tank containing a dozen half-crown-sized angels, and within a month there was little left but the stems. In this instance a readily obtainable cheap plant (it came from the garden pond) provided a supplement to diet which would have been missed in an unplanted tank.

I can’t help thinking that this must be of some long-term benefit, even though it is claimed that dry foods supply everything a fish could possibly need.

Quite a controversial subject when on the subject of planting is the question whether plants should be weighted or not. I have used weights of sorts for years but I am far from satisfied, generally speaking, with the showing I have had from my plants and am experimenting with some non-weight planting to see whether there is any marked difference as I suspect that weights may have pinched the stems and given rise to rotting. Aquarists are often deterred from planting without weights because they claim that the plants shoot up to the surface unless they are held down by something. I rather think this comes of planting much too soon after filling the tank with new water, at which time there are myriads of air bubbles all over the place which quickly raise almost anything to the surface which has not been firmly secured. If left for a day or so the conditions become greatly more favourable, and provided that there is adequate depth of gravel or sand and a reasonable amount of root on the plant, acceptable stability can be obtained quite readily.

Marine Forum

Continued from page 114

holds some strong views on action needed to conserve the marine fauna of Florida and the Keys, a view that can only be supported by all keen marine aquarists in the U.K. and, for that matter, the world. The advancement of civilisation in Florida, it seems, is leading to the destruction of large areas of shallow seas rich in marine fauna. Ironically enough, crushed coral is being used in some areas to extend the land mass seawards—it seems that nothing is sacred!

Every month I receive quite a large quantity of information of interest to the marinist. Recently, one of the larger daily newspapers printed an article on the ringed octopus of the Great Barrier Reef, and it was therefore with great interest that I read in the monthly journal of the Newcastle A.S. (Australia, not upon-Tyne) of their exhibiting one of these mini-monsters at a local exhibition. This animal is, as its name implies, quite attractively marked, and it is commonly found on the eastern seaboard of Australia. One of its less tasteful habits is, however, that it bites—quite painlessly, but unless the victim realises he has been bitten and gets immediate treatment, that’s it!

The only counter to the venom of the octopus is artificial respiration carried out for a considerable period, for there is no specific anti-toxin. This period needs, in some cases, to exceed 5 hours before any appreciable spontaneous respiratory improvements are noted. Once over this crisis, however, victims are usually recovered by the next day. As symptoms of intoxication can occur within 5-10 minutes of being bitten you would indeed have to move very rapidly.

No wonder that our marines are costly. What with these fellows, Pteroïd and stonefish, who’d want to collect them?

ADMITTEDLY, in comparison with some other pet trades, the aquatic field does not see much in the way of deception and sharp practices. However, the other week a colleague out-of-town came to London for the weekend to have a look at and around the capital’s dealers. He had brought with him copies of recent magazines in which many traders were advertising marines. Now it can be said in defence of the advertisers that at the time the advertisement is submitted for publication it cannot be foreseen exactly what stocks will be available, but while all these shops invariably had a stock of freshwater fishes on view, even those who had the word ‘Marines’ in their advertisements in larger type than ‘Freshwater’ were ‘. . . expecting the marines next week’.
If you have never had much success in establishing an Infusoria culture for feeding very small fish fry, try using this procedure. It's the one I've used successfully for years.

For my culture a shallow enamel (or polythene) bowl about 8 inches in diameter and 6 inches high has placed in it a crushed lettuce and over this a kettleful of boiling water is poured. After about half an hour the bowl is topped up with tap water and placed in a situation where the temperature will remain between 60° and 70°F (15–21°C).

At first the water becomes very turbid (a sign of development of bacteria) but soon it clears and is then full of Infusoria. The reasons for these events are quite simple. The air around us contains spores of numerous infusorians. These spores settle in the lettuce water and the infusorians that emerge begin to feed on the bacteria that have already commenced to grow in enormous numbers. When sufficient Infusoria develop they eat up the available bacteria, with the result that the water becomes clear and colourless once more. Turbidity is produced by the presence of large numbers of bacteria, not by Infusoria.

A 'Ripe' Culture

Such a culture is termed a 'ripe' culture and it will be seen that as it is now free of bacteria such a culture has little or no smell and is almost colourless and quite clear. However, if the water is examined closely, it should be seen that clouds of swarming Infusoria are present. These, just as are water fleas, are drawn towards the light. Except for them and a few bits of coarse sediment the water in between should be as clear as water from an aquarium. Conversely it will be realised that the foul-smelling, cloudy, turbid mixture that is so often called an Infusoria culture is not one at all but is a culture of bacteria.

If such a foul concoction is placed in a tank containing fry not only will it provide no food for the fry but it will kill them off rapidly, as it will certainly pollute the water contained in the aquarium.

In spite of all precautions sometimes a culture may develop a mild odour of rotten egg (hydrogen sulphide gas) indicating that oxygen-deficient (anaerobic) conditions are setting in. Mild occasional aeration of the culture, or just stirring vigorously three or four times a day, will soon put matters right. I do not like to aerate cultures vigorously and continuously for Infusoria fare better in static waters.

Incidentally, barring accidents, I set up only one Infusoria culture every year. As the culture in my bowl is taken out for use I top it up with fresh water from the tap and, as the lettuce disintegrates and disappears, I keep adding odd leaves of lettuce to make up the loss. Broadly then, the important points to note are

(a) a good water surface to avoid anaerobiosis;
(b) correct temperature (if the culture is kept too cold Infusoria cannot flourish).

Numerous accidents, like the accidental introduction of
Daphnia or Cyclops to the culture, or a mosquito laying its eggs in the culture, can upset calculations and there have been times when I have found that either through such a 'natural disaster' or pure carelessness or absent-mindedness I am landed with a huge spawning of fish and no Infusoria on which to feed them!

An old furnished tank can then prove a godsend, for it may contain a fairly large number of Infusoria. Some time ago I had a tank containing fancy goldfish in my lounge, and this tank was absolutely teeming with Infusoria although the water in it was beautifully clear. A large filter running day and night assured this clarity and I do not think anybody looking at the tank casually would have ever suspected that it could be so full of infusorians. Yet if I stopped the filter for an hour or so and collected a jam-jar full of water from just under one of the lamps I could gather more Infusoria than I knew what to do with!

The photograph with these jottings shows these infusorians magnified; they belong to the genus Coleps. The picture gives some idea of the concentration of Infusoria that can be obtained in this manner. Of course, the whole tank did not contain such a concentration throughout its whole volume; light attracts these creatures to the surface, where they mass in large numbers.

**Maggots as Fish Food**

The larval stage of the bluebottle fly, commonly referred to as fishermen's maggots, can be easily and cheaply obtained from angling shops in unlimited quantities throughout the year. The maggots are produced by allowing bluebottles to lay their eggs on condemned carcasses or fish. The maggots that drop off the meat after feeding are cleaned by keeping them in bran.

The final product is amazingly clean and entirely free of unpleasant odours. These maggots are taken entire by large fish such as goldfish and cichlids. For the smaller tropicals they have to be chopped with scissors or razor blade.

There is a right and a wrong way of doing even this simple operation. In the process of reducing food such as maggots or earthworms to a size suitable for feeding smaller fishes a certain amount of 'juice' is produced, which is the main factor responsible for clouding the water. A clean chopping action, as provided by a razor blade or a pair of scissors, is hence more desirable than the action obtained with toy mincers or mincers used for preparing baby foods.

This type of food is best chopped into small pieces on a piece of wood with a razor blade or it may be held in the palm of one hand whilst it is chopped with a pair of round-nosed scissors, operated by the other hand. The chopped food may be lightly washed by placing it in a fine-meshed coffee strainer, but this is not absolutely necessary.

Another way is to 'skin' the maggot. This is accomplished by chopping off the head end with a knife on a wooden block and squeezing out the soft pulp by drawing the knife across the length of the maggot from tail to head end. During these manoeuvres the maggot is held on the wooden block by the index finger of the free hand resting on the tail end of the maggot. The soft pulp is suitable for feeding to small fishes. When the operation is successfully performed all that remains

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but its finnage form as well. What other creature displays this ability?
These responsible factors bring additional calculations to our genetical
assumptions.

At the start the breeder must set down just what fish he is aiming
at; general descriptions such as increased size are not accurate enough.
Having done this he must be patient and settle on the improvement of
just one variety of guppy. When commencing these decisions are easy
to stick to, but the temptation comes when, trying to improve X, a
beautiful Y variety is thrown up. The breeder must then steel his
heart and vigorously cull not only inferior fish but non-standard as
well. By practising selection we can over a period eliminate unwanted
genetical factors, but unless the breeder has unlimited facilities it is
still a hit-or-miss affair if he does not stick to his original aims. Top
names are usually only associated with one variety of guppy; can you
do better?

Join a guppy group and learn by example. These groups meet
regularly all over Britain, providing educational and recreational
facilities to say nothing of the chance to compete at shows. Inquiries
should be addressed to the respective secretaries (stamped addressed
envelope, please): F.G.A., Roy Beresford, 99 Valley Road, Arden
Park, Bredbury, Cheshire; F.G.B.S., Malcolm H. Delingpole, Willow
Croft, Tibberton, near Droitwich.

**The Guppy in the Future**

For many years breeders have placed size before all else. Fish were
bred with fins so large that their body muscles couldn't carry them
erect, and we were treated to the humiliating sight of fish skulking on
the bottom of the show jar and tank, ungainly and far from attractive.

Today's guppy breeders are realising that colour, finnage shape
and balance are just as important, and a glance at the winning entries
in recent shows will reveal that the 'monster' phase is rapidly coming
to a close; just as the dinosaurs of old grew too big for their boots,
so too have some types of guppy.

The future should produce once more the wonderful finnage variety
of yesteryear and a return to our tanks of improved self-colours.
Good, solid reds are already re-appearing and ousted the pale
salmon colours, products of the period when breeders crossed fish
indiscriminately in the hope that something would turn up.

Membership in the specialist groups is growing rapidly, but this
must not mean complacency; increased co-operation between groups
will bring a better exchange of stock to the mutual benefit of all.

Females, for so long uninspiring fish with just one finnage shape
and usually devoid of colour, are becoming emancipated and I forecast
yet more finnage shapes and brighter colours for les femmes.

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**PETFISH MONTHLY Guide to**

**Fancy Guppies**

By JIM KELLY

*Chairman, The Fancy Guppy Association*

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**The Guppy**

**Order** Cyprinodontidae

**Family** Poeciliidae

**Genus** Poecilia

**Species** reticulata

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Photographs by ROY BERESFORD
breeding

the chance of the wild, what kind of environment it is very much

breeders learn enough of our fish, our makers, our breeders of
certified and background information

condition and background (to be continued) of body and eyes to

count in (5) for normal; 0 for normal; for each: for

suppose these make a difference

standard lighthouses of port gains

showing and standards

(\) provides the opportunity in breeding new types for body

in our work, and contribute to environment, and each

(\) ALA Marine in body and environment affect

(a) (b) (c)

(d) (e)

(f) (g) (h)

(i) (j) (k)

(l) (m) (n)

(o) (p) (q)

(r) (s) (t)

(u) (v) (w)

(x) (y) (z)
common are: fatty degeneration of the internal organs, caused by 
wrong diet, and yellow grub or Clinostomum. Yellow grubs are tiny 
worms (platyhelminths) that burrow into the skin of the fish and 
raise cysts on the surface. For more about both these ailments see 
DISEASES OF FISH by C. van Duin Jnr. (Iiffe Books Ltd.).

Though not a disease, the occurrence of split fins raises many 
controversies. By experiment and observations from breeders through-
out the world I still think that split fins are congenital (see 'That's 
Torn It', PETFISH MONTHLY, November, 1966).

**Colour in Guppies**

The wonderful colours displayed by guppies are due either to 
pigments contained in special skin cells called chromatophores or to 
reflection and iridescence caused by the guanine crystals in the physical 
structure of the scales.

The basic colours are: red (in cells called erythrophores), orange 
and yellow (xanthrophores) and black (melanophores). Other colours 
are caused by the interaction of the various pigments contained in 
the different levels of the skin; red, orange and yellow are buried the 
deepest, black is throughout the skin and the reflecting iridocytes are 
closest to the surface. The deeper the black pigment (melanin) is in 
the skin the bluer is the reflected light.

**Reproduction**

A member of the livebearing toothcarps, the guppy is not truly 
viviparous (as is man). Its breeding lies between this state and the 
ovoviviparous (eggs incubated inside the mother's body, expelled as 
free-swimming fry). The young embryo fish receive nourishment 
from her for only a short time. Eggs from a guppy female have been 
known to be prematurely expelled into the aquarium, where they 
have hatched out some time later.

The anal fin of the male develops into a structure called the gono-
podium via which the spermatothoraces are transferred to the female at 
copulation. From one to eight successive broods of young fry are 
expelled by her at periods of roughly one month without further 
fertilisation from the male.

Such apparently fatherless births over long periods have caused 
many aquarists to claim 'parthenogenesis', and though this does occur 
in the guppy most of the claims for virgin birth are groundless and 
usually due to the ignorance of the breeder of the female's earlier 
impregnations. Guppies are polygamous and one of the few fishes 
that will tolerate any numbers of their own or opposite sex sharing the 
tank with them.

During breeding programmes many aquarists wish to use a female 
already inseminated by another, unwanted male. So long as the new
The presence of the text is not fully legible due to the quality of the image.
EVERYBODY remembers the first! The trouble is that the fact, unless of universal significance, goes unnoticed at the time and relevant details go unrecorded and cause confusion to the future historian.

The first aquarium society in the United States, in the fullest sense of the word, was started by Baron von Schlichting, on a breezy March day in 1893. Composed in the main by German immigrants to the U.S., they followed the European custom and called the society Triton, after the mythical half-human, half-fish, son of Poseidon or Neptune.

That is now past history, but more up-to-date is the fact that the New World has been the birth of yet another ‘first’ in the aquarium world, the formation of Mexico’s first society devoted to the hobby. Determined that this won’t go unrewarded I set it in the record.

Every country of the world has boasted its patriots, those handful of devoted men and women determined that, come what may, despite all difficulties, they would succeed. Such a person is Orlando Barahona of Mexico City. A keen hobbyist, a specialist fishkeeper, he has travelled widely seeking information and help to promote the growth of piscatorial affairs in that home of ancient civilizations—Mexico.

The difficulties he faced would fill a book, but sufficient to write he has won through and at the start of this year formed his country’s first group. Like all new societies, it consists for a start of just a dozen or so members, all boys between the ages of 12 and 14 years from the local secondary school. Apart from the available native species, Orlando has imported fishes from Germany, and he tells me these will form the nucleus for distribution amongst his group.

I predict that with such enthusiasm at its head, we shall see great things from this part of the world this year—and I am not referring to the forthcoming Olympic Games!

* * *

Marineland of the Pacific at Los Angeles has hatched over 70 swell sharks, but one they have now will be the most unusual of all if it survives.

Highly of the courage and enthusiasm of folk like Calver Bayliss.

* * *

Hide your nets, gentlemen, particularly if the wife is one of those cooks that ‘hasn’t everything’ but needs it in her culinary art! An American woman columnist writing in ‘Hints From Heloise’, asks her female readers to agree that the average kitchen strainer is a pain in the pantry. She claims they are bulky to store, become dinted, rusty, and, when trying to strain bulky foods, half the liquid stays in the mixture and refuses to pour through the strainer.

Her solution is to use the square nets as used by aquarists! It lies flat, doesn’t rust (naturally!), and because of its flexible material, it is simplicity itself to squeeze the last drop out of the mixture being strained—and, if that didn’t convince her readers, the fact that these nets are easily cleaned and hygienic will... especially in a nation obsessed by disinfectants and deodorants.

In the past, in my house, when anything has been missing from the kitchen my ‘better half’ has promptly looked in the fish house. Now it looks as if the reverse is to happen, and it’s no use my hiding this copy of PETFISH MONTHLY—she reads it first!

Watch out, there may be a thief about.

WE are sorry to learn that owing to his illness last winter Mr Bill Armitage still does not feel fit enough to cope with a monthly contribution to our Guppy World. He sends his regrets to readers, who we know will join with us in wishing him an early return to good health.
Readers’ Queries Answered

Surface Pests
Since last cleaning out my tropical fish tank I have noticed the appearance of minute yellowish insects with at least four legs and antennae. They are on the sides of the tank above water level and seem to jump off the surface on to the glass. I am wondering what these are, whether they are here to stay and how I can rid the tank of them.

A number of species of small insects are apt to appear from time to time on the surface of the water, particularly if there are surface water plants present. It is difficult to account for their appearance—they may even come from house plants present in the room or from flower decorations. They are not harmful to the fish, but dead vegetation should be kept clear of the surface, as the presence of this will only encourage them; and it should help if the tank is kept well filled, close to the cover glass or lid, so that the heat from the lamps can serve to deter the creatures.

Old Water
I have just set up a fish tank and have left the water standing for one week. Is this long enough to create the ‘aged water’ I have read about, or should I leave it a little longer before I introduce my fish?

You are getting confused, but don’t let that worry you for the subject of ‘old’ and ‘aged’ water often confuses experienced hobbyists. Letting the water stand will allow the chlorine gas (introduced into the domestic water supply) to escape and make the tank safe for your fish, though this is often overridden by some authors. ‘Aged water’ is water that has been changed by the chemical and biological action of both fishes and plants in an aquarium. For the next tank you set up why not try half new and half old water from a tank already containing fish; you could introduce fish to this immediately and it would be much more acceptable from the fishes’ point of view, provided that it was brought to the correct temperature.

* Miniature Worm Foods
Could you publish your queries column please tell me: (a) are Grindal worms good food for my fish; (b) how often should one feed with them? (c) Have I heard that overfeeding with these and white worms can kill fish.

Enchytraeus buchohuali, or Grindal worms, by virtue of their size fill the gap in feeding fish when such first foods as brine shrimp are too small and white worm and Tubifex are too large. Although that is the text-book explanation, in practical experience we have never noticed the need for transient size food. The use of both Grindal and white worms can cause certain problems and I find it easier to stick to just one. Because of their high fat content (52.5%), they must be fed sparingly. Overfeeding with these members of the oligochaetae (pronounced o-lig-o-keets) can cause fatty degeneration (see page 192 of Diseases of Fishes by H. van Duijn, Jr.

Scats
Could you please supply the following information regarding scats in aquaria? (a) Do they prefer fresh or marine water? (b) What is the best diet for them? (c) How does one sex them? Most of the reference works I have consulted seem to conflict on this info.

These fish can tolerate both fresh and salt water, preferring the latter, and about a 35% mix is just about right. The scientific name, Scothaphus argus, means ‘eaters of dung’ and they are often found in their native haunts frequenting the sewer outlets; omnivorous, they will eat almost anything but lace the diet with plenty of green food. Females are much fatter in the belly region and usually less colourful than their male counterparts. Given good diet and environment they often live up to 5 years in the aquarium.

It is regretted that the continuation of the listed selection of marginal plants for the garden pond by D. B. McNernry has had to be held over until our July number.

Practical Jottings
Continued from page 118

behind on the wooden block is the thin, transparent cellulose-like cuticle (skin) of the maggot.

After being kept for a time the maggots cease to move about and pupate. Their brown cigar-shaped pupae are popularly referred to as husks. Even at this stage they will be readily accepted by large fishes in, and after squashing, by the smaller ones.

Later on the brown colour deepens to brownish black and, at this stage, if the husk is squashed in water, a cloud of fine particles is liberated. These pieces are useful for feeding to fry at the brine shrimp stage. The adult flies that emerge ultimately from the husks are of little interest to the aquarist except those who keep large cichlids or the archer fish, but are of value to those who have lizards or frogs.

The change from maggots to husk and fly can be delayed for a long time by keeping the maggots in a refrigerator. Unwanted husks should not be allowed to lie about and odd maggots should not be permitted to escape or the bluebottle population of the house will show a sharp increase.

PetFish Monthly, June 1968
PFM Photo COMPETITION

Selected for publication this month from the entries received for the PFM Photo Competition is this picture of a community aquarium scene by Mr. K. L. A. Appleyard of South Ockendon, Essex.

There are no special categories of entry for this Competition. Photographs in black and white or colour (prints or transparencies) can show your favourite fish in close-up, the interior of your aquarium, fish breeding or other fish behaviour, or your garden pond. Each entry will be judged according to photographic merit as well as for its interest to fish-keepers. Main cash prizes will be £5 each, with subsidiary prizes of £2 each, plus a monthly chance of being paid one guinea if a picture is selected for printing in an issue of PFM appearing before final judging and announcement of results. Use the entry form from a current issue of PFM when sending your pictures and please read the Rules and Conditions for the Competition printed on this page.

Rules and Conditions

The following rules should be adhered to:

1. The competition is open only to amateur photographers.
2. Each entry or set of entries (no limit to number) must be accompanied by a completed entry coupon from a current issue, and sent to PETFISH MONTHLY (Photographic Competition), 354 Garrett Lane, London S.W.17. Final closing date for entries will be 30th September 1968.
3. All reasonable care will be taken of prints and transparencies but responsibility cannot be accepted for entries lost, delayed, mislaid or damaged in the post or otherwise. Proof of posting cannot be accepted as proof of delivery.
4. Each print or transparency should bear the name and address of the sender in capital letters.
5. Black and white prints should be glossy preferably, of not less than postcard size. Negatives should not be submitted.
6. Receipt of entries will be acknowledged only if a stamped addressed postcard is sent with the photographs.
7. Prints and transparencies will be returned after the final results are announced only if a stamped and addressed envelope for this purpose is provided.
8. Entry into the competition will be deemed to constitute submission of the photograph for reproduction in PETFISH MONTHLY and reproduction fees will be paid for any material not in the prize-winning categories that is published.
9. Prize-winning photographs will be published in PETFISH MONTHLY (when the final results are announced) without further fee.
10. The decision of the Editor of PETFISH MONTHLY will be final and binding in all matters affecting this competition and no correspondence can be entered into concerning the competition.
AT THE annual inter-society table show held by SWILLINGTON A.S. the Societies invited were: Aireborough, Bradford, Dewsbury, Horsforth, Pontefract, Tadcaster, Wakefield and Wetherby Rose York. The best fish in the show award went to Mr. J. Whiteley and Aireborough was the winning Society, gaining 30 out of a total of 85 points (2, Pontefract; 3, Dewsbury). Detailed results were as follows.

Barbs: 1, Mr. G. P. Nash; 2, Mr. Goodall and Mr. Piper; 3, Mrs. S. Betty. Canton: 1, Mr. R. Taylor; 2, Mr. P. Corey; 3, Mr. P. Barrett. Anubias: 1, Mr. T. Swarbrick; 2, Mr. J. Whiteley; 3, Mr. G. P. Nash. Characins: 1, Mrs. M. C. Marshall; 2, Mrs. M. C. Marshall; 3, Mrs. M. C. Marshall. Cichlids: 1, Mr. R. Taylor; 2, Mr. R. Taylor; 3, Mr. R. Taylor. Fishers: 1, Mrs. M. C. Marshall; 2, Mrs. M. C. Marshall; 3, Mrs. M. C. Marshall. Catfish: 1, Mr. P. Corey; 2, Mr. P. Corey; 3, Mrs. M. C. Marshall. Catfish eggs: 1, Mr. R. Taylor; 2, Mr. R. Taylor; 3, Mrs. S. Betty. Groupers: 1 and 2, Mr. G. Thickbroom; 3, Mr. K. Marshall. Livebearers: 1, Mr. J. Whiteley; 2, Mr. B. Massie; 3, Mr. F. Mountain. Eggs: 1, Mr. P. Reynolds; 2, Mr. P. Reynolds; 3, Mr. P. Reynolds. Egglayer pairs: 1, Mr. P. Corey; 2, Mr. B. Shepherd; 3, Mrs. M. C. Marshall. Livebearers pairs: 1, Mr. J. Whiteley; 2, Mr. B. Shepherd; 3, Mr. R. Taylor. Ship: 1, Mr. R. Taylor; 2, Mr. R. Taylor; 3, Mrs. S. Betty.

Club meetings have been well attended and members have enjoyed a short talk on fish diseases given by Mr. J. Skinner, who also dealt most helpfully with some other problems encountered in fishkeeping. At recent table shows Mr. G. P. Nash has won the Richardson Pet Shop trophy for small barbs, Mr. D. Newman has received the W. Gawthorne trophy for Corystus and Mr. P. Reynolds the A. F. Gawthorne trophy for a.o.v. cats and loaches.

FORTY-SIX members of MID-SUSSEX A.S. were entertained recently by HENDON & D. A.S.—via the niceties of a slide show and tape recording describing different types of tropical and coldwater fishes. Vice-chairman Mr. D. J. Soper writes: ‘The slides and tapes were of excellent quality and credit must go to the time and trouble which the Hendon Club took in compiling such a wonderful programme’. At this meeting members were able to buy several varieties of fishes at very reasonable prices from other members who had successfully bred them. Any fishkeepers in the area who have not attended a club meeting are cordially invited to do so and Mr. Soper (31 Park Road, Burgess Hill, Sussex: phone Burgess Hill 2541) will be delighted to give details.

‘CLUBS interested in film shows should contact their local education authority—most of them have films for hire connected with our hobby’ writes Mr. L. G. Howard, secretary of BLACKPOOL & FYLDE A.S. After describing two very interesting films hired from Blackpool Education Authority for the entertainment of club members. One dealt with the life cycle of the newt and the other showed the setting up of a fresh-water aquarium with the expeditions entailed to rivers and ponds for gravel, rocks, plants and fishes. Other films hired from the Rank Film Organisation made up a very entertaining programme. The films were shown on a projector that the club had out on trial with a view to buying—‘Anybody with aquatic films to hire out?’ asks Mr Howard. ‘We bought it!’ Other meetings have included a talk on fish breeding and rearing by Mr Chris Jones, who made some interesting points about what to feed to the fry, and which fry to cull from the batch and dispose of. Singleton trophy (single fish) results at recent club table shows have been: 1, Mr. T. Swarbrick; 2, Mr. C. Jones; 3, Mr. J. Taylor. ‘A. C. Jones’ trophy: 1, Mr. R. B. Shepherd; 2, Mr. B. Simmons. Robinson trophy (pairs): 1, Mrs. M. C. Marshall; 2, Mr. A. Marsden. A. F. Gawthorne trophy (egglayers): 1, Mr. B. Simmons. Breeders (livebearers): 1, Mr. B. Simmons. Breeders (egglayers): 1, Mrs. S. Betty.

THE CURATOR of the aquarium at Chester Zoo, Mr. F. Williams, very kindly presided over the A.G.M. and presentation of awards, which

WHEN Mr. C. H. Keeling of Pan’s Zoolological Garden, Ashover near Chesterfield described the success he had had with marinans to members of DERBY REGENT A.S. he stressed that this had been achieved at the expense of many of the ‘rules’ that were often considered essentials. He had successfully kept tropical and marine marine life in large iron tanks, using strained sea-water and ordinary sea-shore sand. Club members found Mr Keeling’s lecture, though not primarily concerned with fish, extremely entertaining illustrated as it was with a number of interesting creatures including a 12 ft. Indo-Australian python, and warmly recommend it to other clubs.

CHESTER & D. A.S. held in conjunction with their annual dinner, when their president, Mr. A. S. Motterhead, was unable to attend. Mr. R. E. S. Dutton won the Motterhead Cup for the best furnished aquarium and a shield was presented to the runner-up, Mr. R. E. S. Dutton and the special cup for the breeders class went to Mr. C. Bowyer and the John Evans Cup for the highest number of table show awards to Mr. E. V. Stokes. Mr. R. E. S. Dutton also won the Pabo Cup.

Club officers are: chairman, Mr. E. V. Stokes; secretary, Mrs. A. Dutton (The Limes Farm, Tarvin, Chester); treasurer, Mr. P. Tomlinson; librarian, Mr. R. E. S. Dutton; fish breeding recorder, Mr. C. Bowyer. The society has a full programme for the year. Meetings are held every first and third Thursday of the month at 7.30 p.m. at The Oddfellows Hall, Lower Bridge Street, Chester. New members are very welcome.

In any discussion that arises on the subject of the overspill town, BANBURY A.S. would have a lot to say in its favour. Overspill population in the area has brought a wealth of membership over the last year. Table shows and lectures have been most prolific and among the new and old members have enjoyed a varied programme. Mr Brian Herbert has given advice to fellow club members on keeping, breeding and managing coldwater fishes; Mr K. A. J. Turner from London gave a most interesting slide lecture on aquarium pond and bog plants; a Three Counties inter-league table show was recently held. Mr J. Stillwell, the well-known F.B.A.S. judge from Portsmouth awarded a total of 96 points to Basingstoke (2, Reading, 88 pts; 3, High Wycombe, 61 pts; 4, Bracknell, 53 pts). A good number of fish awards at this meeting were: 1, Mr. P. Merritt (N. anomalous); 2, Mr. S. Wingrove (bleeding-heart tetra); 3, Mr. F. Lange (Pimelodella gracilis).

Other table show results have been as follows:

A. V. coldwater judge, Mr. H. Herbert: 1, Mr. A. Marshall; 2, Master R. Blight; 3, Mr. A. Marshall. A. V. tropical: 1, Mr. A. Marshall; 2, Master R. Blight; 3, Mr. A. Blake. A. V. breeders team: 1, Mr. F. Lange; 2 and 3, Mr. A. Marshall. A. V. propagation: 1, Mr. A. Marshall; 2, Master S. Roe; 3, Mr. F. Lange. A. V. tank (22nd March): 1, 2 and 3, Mr. A. Blake.

WITH the arrival of 27 aquarists to the first meeting of the EALING & D. A.S., one of the society’s earliest decisions had to be to find larger accommodation. (This was
accomplished by the second meeting, which was held at Northfields Community Centre main hall.) The table show at the first meeting was judged by Mr Harry Towell, who gave few prizes, many of whom were complete novices at showing. Some invaluable advice on the things he looked for while Judging. At the second meeting, after a slide show, Mr Towell again judged the table show. Secretary Mr Roy Basset came first, in both the labyrinth and characin classes. Other labyrinth class awards were: 2, Mr L. Sandfield (honey gourami); 3, Mr A. Betterly (leeri gourami) and in the characin class Mr Savage was second with a cardinal tetra and Mr Ankin third with a penguin.

The club meets on the first Tuesday of each month and new members are very welcome. Details from the secretary (8 Grove Court, The Grove, London, W.5.).

THE SECRETARY's report at the A.G.M. of BRISTOL A.S. gave a clear indication of an active club membership. He recorded that the Society had provided judges and exhibitors for most shows within an 80 mile radius of Bristol and speakers for club meetings as far away as Weymouth, Trowbridge and S. Wales. Awards to members exhibiting in outside shows included the highest, points awarded, 26 first, 25 seconds, 21 thirds etc., together with cups, trophies, plaques and diplomas too numerous to mention! Two members exhibited in the Champion Class at the B.A.F. and this club outing, together with one to Windsor, proved the highlights of the club's social year, with 50 members attending each function. Officers for the club's current year are: president, Mr J. Savage; vice-president, Mr F. Brown; secretary, Mr W. Harnham (15 The Holts, Marlwood, Bristol 4); assistant secretary, Mr J. Phillips; treasurer, Mr J. Brown; registrar, Miss H. Morgan; programme secretary, Mr P. Greenhill; auditors, Mr Brock and Mr Thomas; committee members, Mrs P. Kimber, Mr R. Berry, Mr G. Stone, Mr H. Jago, Mr M. Howes, Mr J. Lewis, Mr R. Lewis and life member, Mr Sydney Davis.

THE SECRETARY of HUTTON GRAMMAR SCHOOL A.S. would be glad to receive from club secretaries details of the number of juniors they have and how many show schedules are required. This is the third junior open show that the School Society has held and they are hoping for a really wide response this year. Entry fees are still only 6d per entry and schedules are available. The secretary's address is: Mr N. Swindichurst, 25 Hennel Lane, Walton-le-Dale, Preston, Lancs. and that of show secretary Mr D. J. Radcliffe is: 179, Todd Lane, South, Lostock Hall, Preston, Lancs.

The secretary has been informed that the European A.S. has decided to adopt the F.B.A.S. rules for their annual show, which will be held in May. He also stated that the Society has been invited to take part in the National A.S. show to be held in London in June.

IF your Society is affiliated to the F.B.A.S. are you making an entry in the Society Tabolous section of THE AQUARIUM SHOW, 7th-10th November in London this year? Space is being allocated in order of applications received so please write to the Show Organiser at your's offices as soon as possible. Now is the time to begin to plan your Society's entry—further details on page 128.

The Society is now affiliated to the F.N.A.S.

HOUNSLOW & D. A.S. are aiming for an entry of 1000 when they stage their open show in September this year. The success of last year's show, with over 600 entries, makes them confident that this target may well be achieved. They aim also to maintain the high standard of prizes given at least year's show.

Social events in the Society are being well supported. The latest one, as usual wonderfully organised by social secretary Mr Bob Nellums, was a tour of old London pubs. As it was a coach trip, breathers were held no terrors as the members visited the Prospect of Whitty, Dirty Dicks and other historic inns.

The society has been active in another field recently when members put on a really splendid display of tropical fishes to support the Mayor of Hounslow's fête in aid of the Heart Research Foundation. Visitors were immensely interested in the fishes and a good sum of money was raised for the charity. Table shows and regular meetings bring good attendances and recent talks given by club members have included subjects ranging from the care of aquatic plants to breeding cichlids.

New members are most welcome and can obtain details from secretary Mr D. J. Woodward (34 Uxbridge Road, Hanworth, Middlesex).

The best fish in the show was to Mr M. Walsh for a fantail goldfish at the NELSON A.S. annual open show. A record 305 entries were received from a wide area and the Society were especially
Pet Fish Monthly, June 1968

THIS IS the month of the NATION-AL FURNISHED AQUARIUM EXHIBITION. We hear from Mr Keith Barracough that entries have been received from all parts of the country (1st June is the very last date for entries), and aquarists are looking forward with immense interest to the array of standard-sized stain- less-steel aquariums decorated with all the skill of the professional and non-professional exhibitions. Advertisements on television are expected to attract many collectors who will want to keep aquaria after seeing this show. There should be many new ideas and hints on tank decoration even for established aquarists who go to see the appearance of home tanks all over the country should benefit from the ideas displayed. Three pieces of Valls, and a Cryptocoryne alone will definitely ‘not do’ in future! Members of Bradford & D. A.S. will be helping to cope with the enormous amount of work involved in setting up, stencilling and de-benching the exhibits. The organisers will have the mammoth task of making certain that the display at both the Exhibition and at the Kill retail establishment in Bradford are kept at their peak for visitors, Wednesday, Thursday, Friday, Saturday and Sunday (11th June-16th June) at St. George’s Hall, Bradford are the dates and venue (times 10:30 to 8, and 10 to 5 on Sunday).

Members of BRIGHTON & SOUTHERN A.S. really enjoyed the slide-tape lecture on the F.G.A., in which Mr Jim Kelly gave a colourful and lucid account of his travels through the Everglades in Florida. The humorous commentary describing his exploration of the Everglades jungle was particularly charming. A storm during a flight in a private plane, local Indian tribes and many tourist attractions was accompanied by a wealth of excellent colour slides. A record number of members attended the table shows for Cory- doras and a.o.v. catfish, Mr Brian Baker from Uxbridge judged the entries in front of members, and whilst doing so explained how each entry had been pointed. Awards made were: Corydoras a.o.v. 2nd, Mr R. A. Aldis; 2nd Mrs L. Jeffreys; 3rd M. Whittington. A.o.v. 1st Mr P. Wynd- ham; 2nd Miss E. Jeffreys; 3rd Mr D. Soper. New members are cordially invited to club meetings, held fortnightly on Wednesdays at the Prince George, Trafalgar Street, Brighton.

A GUPPY owned by Mr Brian Shortle with the best fish in the show award (an aquarium donated by Rochdale AM A.S. open show. Entries were received from members of 22 for 1967. (The Society was first in the Northern Show League for the year.)

STOCKTON-ON-TEES A.S. held their third annual show on the 21st April and the thicket gourami shown by Mr Whitlock won the best fish in the show award. Detailed results were:

- Furbished aquaria: 1st Mr. T. Stephenson, Fur- bished jar: 1st M. G. Scott, 2nd Mr. Shorthouse, 3rd Mrs. Batty. Fishers: 1, 2 and 3, Mr. Whitlock. A.o.v. Idyllith: 1st, Mr. White. Miss Dodd, 2nd Mrs. Batty, 3rd Mrs. Batty. Large Aquaria: 1st, Mr. White. Miss Dodd, 2nd Mrs. Batty, 3rd Mrs. Batty. Small Aquaria: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. Small Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 5cm Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 3cm Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 2.5cm Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 2cm Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. Catfish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 2m Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 1m Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. 50cm Fish: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty. Conclusion: 1st Mr. T. Stephenson, 2nd Mr. White, 3rd Mrs. Batty.

Members: 1, Mr L. Collins; 2, Mr. Turnbull; 3, Mr Lewis. Scavengers: 1, Mr Sykes; 2, Mr. Rainbow. Pairs: 1, Mr. White. Guineas: 1, Mr. A. Middleton; 2, Mr. Leach, 3, Mr. White. Dwarf cichlids: 1, Mr. J. Chamberlain; 2, Mr. T. Shorthouse, 3, Mr. White. Exploring toothcars: 1, 2 and 3, Mr. P. Sonley. Saguamons: 1, Mr. White. Coydoras: 1, Mr. White. Sonley. A.O.V.: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. A.O.V.: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Cichlids: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Catfish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Pairs: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Solids: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Catfish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. A.O.V.: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Cichlids: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Catfish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Small fish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. 2m Fish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. 1m Fish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. 50cm Fish: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley. Conclusion: 1, Mr. White. Batty; 2, Mr. P. Carey; 3, Mr. S. Bowley.
In Brief...

...NEWLY formed TONBRIDGE & D.A.S. meet on the second Saturday of each month at 8.00 p.m. at Dalgate Hall, Tonbridge and new members are most welcome. The society's committee is: chairman, Mr. L. Hills; vice-chairman, Mr. D. Allin; treasurer, Mr. R. Baker; show and social secretary, Mr. M. Bailey; secretary, Mr. I. T. Matheson.

...OFFICERS of ROEHAMPTON A.C. for the year are: chairman, Mr. E. Bellingham, Mr. J. Williams.

The Tisbury Trophy for the Wantstows D. A. S. home furnished aquarium competition was presented by Mr. Tisbury to Mr. D. Goodbody and Mr. T. Needham.

THE THIRD INTERNATIONAL GUPPY SHOW is being held on Sunday, 9th June at the Drill Hall, 3 Streeterford Road, MANCHESTER.

This show is open to all, whether members of the FANCY GUPPY ASSOCIATION or not, the only exception being the master breeders classes which will be restricted to members. Branches take place from 4.30 to 7.00 p.m. on Saturday, 8th June and the show is open to the public from 10 a.m. to 5 p.m. next day.

Mr. K. Clough won in the GOSPORT & D. A. S. home furnished aquarium competition, with Master I. Peman taking second and third places. The society also won in the inter-club competition held with PORTSMOUTH, WINCHESTER and SOUTHWAMPTON A.S. Secretary Mrs. J. Wright (20 Prideshead Brune Avenue, Bridge- city, Gosport, Hants) will be pleased to supply details of club meetings to prospective new members.

Mr. C. McDonald (25 Moss Lane, Broadbottom, via Hyde, Cheshire) is the new secretary of GLOSSOP A.S. The society's open show on 9th June are available from Mr. R. Tomkinson (16 July St., Chorlton-on-Medlock, Manchester).

...22 MEMBERS and visitors (with 115 entries for the table show) attended the first meeting of the BIRMINGHAM SECTION of the FANCY GUPPY ASSOCIATION. Meetings will be held on the fourth Sunday of each month at Glebe Farm Community Centre, Glebe Farm Road, Stetchford (1 mile N.W. of Elmdon Airport) at 2.30 p.m. Officers of the new section are: chairman, Mr. S. Croft; secretary, Mr. M. H. Delingpole (Fairfield, Radford Road, Alvechurch); show secretary, Mr. P. Jinks (315 Stock- field Road, Yardley, Birmingham).

...MASTER W. CROOK has won the shield for the most points gained at table shows held by CILTEROE & D. A. S. during the past year, it was presented at the A.G.M. when the retiring officers were re-elected for the coming year. Meetings are held on the second Wednesday of each month at the Dog & Partridge Hotel, Wellgate, Clitheroe, at 8.00 p.m. Everybody welcome! Mr. T. Hallett, the secretary, of 64 St. Huberts Street, Gt. Harwood, nr. Blackburn, Lancs, will supply further details of programmes and activities.
... MR G. HAYNES is chairman of SMETHWICK & D. A.S. for the coming year and Mr G. C. Wyse vice-chairman. Other officers elected are: secretary, Mr D. L. Black (27 Murdock Place, Windmill Lane, Smethwick, Warley, Wore); treasurer, Mr J. Harris; show secretary, Mr R. F. Biddle; newsletter editor, Mr R. Welsbie; committee, Mr S. Whitehouse, Mr D. H. Johnstone; Mr E. W. F. Smith, Mr A. Walker, Mr H. Ainge, Mr D. Shepherd.

CHANGE of secretary for STRETFORD & D. A.S. is announced. The new officer is Mr Barry Ogden (107 Crofts Bank Road, Davyhulme, Urmston, Manchester).

... REIGATE & REDHILL A.S. were joined at their April meeting by members of CRAWLEY A.S. and MID-SUSSEX A.S. and the 65 club members present spent a very enjoyable evening. A picture quiz (won by Mr P. Collins of Reigate) broke the ice and the inter-club quiz that followed was won by Mid-Sussex. Mid-Sussex A.S. also won the table show, judged by Mr Eric Large.

... CHAIRMAN of HORSHOROUGH A.S. for the coming year is Mr R. Hampson (secretary, Mrs B. Helm, 29 Wellington Road, Leeds); treasurer, Mr M. Pinnall; show secretary, Miss J. Helm; social secretary, Mrs J. Dickinson. The club’s newsletter is sporting a splendid new glossy, stiff, cover bearing the photograph of an angler fish on the front.

... FROM the end of April, HUDDERSFIELD T.F.S. meetings are being held fortnightly at the North Newhol Baptist School, to which old and new members will be welcome. Officers and committee for the Society’s year are: chairman, Mr J. Wyke; vice-chairman, Mr B. Robinson; treasurer, Mr D. Brown; show secretary, Mr E. Kaye; secretary, Mrs M. Bone (1 Bradshaw Drive, Honley, nr. Huddersfield); committee, Mr Bramires and Mrs C. Milnes.

... MR G. JAMES of Newport A.S. judged the table show at the April meeting of LLANTRIT MAJOR A.S. and awarded the following places: A.V. livebearers: 1, Mr A. Rogers; 2, 3 and 4, Mr A. Ibbertson. A.V. egg layers: 1 and 4, Mr D. Sebright; 2, Mr A. Ibbertson; 3, Mr A. Rogers. The club had the pleasure of a visit from Mr Tippins, assistant secretary of Barry A.S., at this meeting.

... A CHILDREN’S playground, an aviary and a museum are among the additional attractions being offered by OLDHAM & D. A.S. this year at their open show in September (see Dates for Your Diary). There will also be a film and a lecture by a well-known speaker. The venue is at Werneth Park, Oldham (2 miles from the city centre on the Manchester Road. Bus routes 20, 21, 22, 82 and 98; a large car park is available).

... RUNNYMEDE A.S. report good attendances at table shows and meetings. The Society are again taking part in the local Staines carnival by exhibiting in the hobby section, and they also plan to take part in the Staines Aquarium Show in London in November. The recent inter-club table show with WEYBRIDGE A.S. resulted in a win for the host team by 920 points to 905. Individual winners were: 1, Mr R. Biggs (Runnymede); 2, Mr H. Aylott (Weybridge); 3, Mr F. Grosover (Runnymede); 4, Mr D. Lambert (Weybridge).

... OFFICERS elected at the A.G.M. of the INDEPENDENT A.S. were: president, Mr F. Tomkins; chairman, Mr G. Dickson; vice-chairman, Mr J. Kettle; show secretary, Mr C. Pegrum; secretary, Mrs L. H. Ratcliffe; treasurer, Mr T. Stevenson; P.R.O. Mr A. Scud.

ATTENTION Wales and The West! On 20th April a meeting, attended by 30 representatives from aquarist societies in Wales and the south-west counties, was held in Bristol at which it was decided to form the WALES AND THE WEST FEDERATION OF AQUARIST SOCIETIES. The intention is to establish a closer liaison between the clubs in the area by listing names and addresses of current club secretaries and of those prepared to offer their services as speakers and judges. Existing Federations, it was thought, were too remote to serve the western area adequately; it was hoped that other common benefits would result in the course of time. Officers elected so far are: chairman, Mr F. Barly (Bristol); secretary, Mr F. A. Barry (Bristol), 18 Foxcote Road, Ashton, Bristol 3; treasurer, Mr L. Nightingale (Keynsham).

Will any clubs in the area who are interested in the venture but were not advised of the meeting please contact Mr F. Barry, in writing, giving the address of their club secretary, and they will be furnished with full details.

... A CHANGE of address is announced by the secretary of HARLOW A.S. Correspondence to Mr J. B. Duncan should now be sent to 113 Little Pynchons, Harlow, Essex.

... RESULTS of the table show for characins and cichlids held by NEW FOREST A.S. were as follows: Characins: 1, Mr M. Lee; 2, Mr R. Menhennett; 3, Mr A. Williamson. Cichlids: 1 and 3, Mr M. Lee; 2, Mr K. Newton. Meetings of the Society held at Lymington Community Centre have been well attended recently with good support for the table shows. Members greatly enjoyed the slide lecture on water gardening by Highlands Water Gardens of Rackmansworth showing methods of choosing a site, construction and planting garden pools.

... GUEST speaker at the April meeting of NEWPORT A.S. was Mr Barry James of Cheltenham, who lectured on plants, both common and rare, for the aquarist. Judge at the table show, Mr Richard Wigg of Llantrit Major, awarded a first to Mr John Overland in the characin class and to Master Alan Berry in the platy class. At the inter-club table show with CARDIFF A.S., the Society lost to the guests by 487 points to 484 (only the second defeat in seven contests).

Individual results were: livebearers: 1, Mr J. Panons; 2, Mr Townsend and Mr Counsell; 3, Mr C. Harding (all of Cardiff). Egglayers: 1, Mr D. Warrnett (Cardiff); 2, Master A. Berry (Newport); 3, Mr J. Overland (Newport).

... THE open show to be held in July by EAST LONDON A. & P.A. will consist of club and individual furnished aquaria, breeders classes, pairs of livebearers and plants. Plaques will be given for first, second and third in their classes and the I.G.M. trophy will be awarded to the winner of the club furnished aquaria. An F.B.A.S. Championship class trophy can be won outright for a.v. characin breeders class.

... YATE & D. A.S. has recently been re-formed and new and old members are giving great support.
A lecture by Mr King of Bath, an expert on reptiles and amphibians, proved extremely interesting and table show results at this meeting were: Barbs, open class: 1, Mr C. Calway; 2, Mr F. Brown; 3, Mr P. Weir. Novice class: 1, Mr D. Creec; 2, Mr E. Verinder; 3, Mr D. Walsh, Angels, open class: 1, Mr K. Watkins; 2, Mr R. Jewon, Novice class: 1, Mr K. Watkins; 2, Mr A. Evans.

SHOW SECRETARY OF UXBRIDGE & D. A.S. informs show secretaries in and around the London area to forward half-a-dozen schedules of their open shows to him so that his Society may give their support. Principal officers for the year are: chairman, Mr P. Ginger; secretary, Mr R. Forster; treasurer, Mr J. Peters; show secretary, Mr N. V. Lee (46 Airedale Road, Ealing, London, W.3). Club members expressed their thanks to retiring chairman Mr H. Moore for all his efforts on their behalf and the hope that he and Mrs Moore continue as club members for many years.

MEMBERS OF BRADFORD & D. A.S. will need to be in good training for their mammal effort this year. Not only will they be helping to erect, steward and dismantle, at the first National Furnished Aquarium Exhibition (13th-16th June) but less than a week later the club's own open show is being staged.

RECENT table show results from RUGBY & D. A.S. have been received. Barbs: 1 and 3, Mr K. Russell; 2, Mr W. Woolerton. Characins: 1, Mr R. Daldy; 2, Mr D. Green; 3, Mr H. Harris. Breeders egglayers: 1, Mr H. Harris. Juniors: 1, and 3, Mr D. Green; 2, Mr F. Underwood.

A REALLY good attendance greeted Mr Mike Bradley when he lectured to DUDLEY & D. A.S. on marine tropics—'64 cups were used during the tea session.' is the way chairman Mr S. Croft assesses the numbers. The talk and film show were voted first-class; then followed the table show, for which 47 entries were berthed. Results were as follows:

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<td>Mr L. Smith</td>
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<td>Mrs J. Smith</td>
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<td></td>
<td>Mr P. Smith</td>
<td></td>
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</tbody>
</table>

POSITIONS in the M.A.L. table after the show at Northampton are: Atherstone, 39; Coventry, 41; Leamington, 46; Northampton, 48; Rugby, 40; Bedworth, 43. Individual winners were: 1, Mr J. Croft, a.c.; 2, Miss J. Smith, a.v.c.; 3, Mrs D. Smith, a.v.; 4, Mr A. Croft, a.v.; 5, Mr J. Smith, a.v.; 6, Mr P. Smith, a.v.; 7, Mrs D. Smith, a.v.; 8, Mr A. Croft, a.v.; 9, Mr J. Smith, a.v.

YEUVIL & D. A.S. were the winners of the shield, to be held for one year, at the inter-club show with TAUNTON A.S. Judge Mr Matley of Bournemouth awarded placings for the best fish on show as follows:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Species</th>
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<tbody>
<tr>
<td>1st</td>
<td>Chisibl...</td>
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<tr>
<td>2nd</td>
<td>Mrs G. Smith</td>
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<tr>
<td>3rd</td>
<td>Mr L. Smith</td>
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<td></td>
<td>Mr P. Smith</td>
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</tbody>
</table>

At the club's April meeting, a '6-inch coldwater' show was held. Mr V. Collins was awarded first, second and third prizes for veiltails.

TALKS on danios, rasboras and white cloud minnows, on barbs, live and dried foods, and pond making are part of the programme members of SOUTHEND, LEIGH & D. A.S.

have been enjoying this year. Table shows have been well supported and table show positions now are: Mr R. Passmore, 11 pts; Mr R. Waulking, 6; Mr P. F. Capon, 5; Mr D. Edwards, 4. This year, for the first time, members placed at an inter-club show will be able to include the corresponding number of points in their total.

MR W. C. CHRISTIAN has been made a life member of NOTTINGHAM & D. A.S. Officers elected at the club's A.G.M. were: chairman, Mr Goodliff; treasurer, Mr Binns; show secretary, Mrs B. Scrimshaw; breeders' section secretaries, Mr Irmann and Mr Wood. Secretary is Mr K. Green (235 St Anne Well Road, Nottingham) and he welcomes enquiries from prospective new members.

MR DICK ARMSTRONG of the B.K.A., greatly entertained members of GUILDFORD & D. A.S. recently with an illustrated lecture which proved very informative. New members are welcome to attend club meetings and hear expert lectures such as this; Mr T. Walker, the secretary (67 Applethorpe Avenue, Guildford, Surrey), will be pleased to supply details.

AT THE BRENT A.S. final table show for section 1, series 2 of the Brent Challenge Cup competition, results were as follows. Breeders: 1 and 2, Mr J. Raymoni; 3, Mr R. Fox. Coldwater: 1, Mr A. Fellows; 2 and 3, Mr R. Fox. Toothcarps: 1, Mr P. Shrimpton; 2 and 3, Mr R. Fox. Best in show award, Mr B. Fellows. The Denis Smith trophy was won by Mr R. M. Fox with 24 points and the overall championship position has reached an interesting stage with the leaders being Mr T. D. Smith (64 points), Mr C. Swinburne (61 pts), Mr R. Fox (53 pts) and Mr P. Shrimpton (39 pts).

VISITORS to PORTSMOUTH A.S. inter-club show on 2 June have a choice of amusements available. A tour of the town, a day on the beach or entertainment and refreshments at the show. Entrance to Mr W. T. Ryker, 493 Commercial Road, Mile End, Portsmouth. Hats, please.

THE INTERNATIONAL MARINE STUDY SOCIETY have, after prolonged trials, released their

Continued on page 129
The AQUARIUM SHOW 1968
7th—10th November at the
Royal Horticultural Society
Old Hall, Vincent Square,
London S.W.1

made to Societies staging the first
three selected in this way.

Open Classes
Classes open to entries of single
fishes from all aquarists will be
detailed in schedules to be sent out
shortly. The schedules will also be
available (in July) from the Show
Organiser at F.B.A.S.'s offices. F.B.A.S.
judges will assess the entries for
award of trophies and show cards.
Entries in this section will be limited
to two per person per class.

Specialist Society
Displays
Arrangements are being made
with bodies representing specialist
interests in the hobby to stage their
own displays and, where agreement
is obtained, relevant fish entries will
be accepted for competition and
judged within the specialist group's
display. For such fishes there will
not be separate classes in the
AQUARIUM SHOW's general
open section.

A S a result of further meetings of
the Federation of British Aquatic
Societies working committee (Mr.
A. G. Jessop, Mr D. Ellis, Mr T.
Glass, Mr S. Moonen, Mr F. Stone
and Mr F. Tomkins) with Mr Cliff
Harrison (F.B.A.S.), and since the April
meeting attended by delegates from
aquarium societies, the general ar-
rangement of the AQUARIUM
SHOW has been formulated.
The AQUARIUM SHOW 1968,
sponsored by F.B.A.S. and organised
with the co-operation of the F.B.A.S.
will present aquarium-keeping to the
public with participation of aquarium
societies in these main ways:

Society Tableaux
Open Classes for Single Fishes
Specialist Society Displays

Society Tableaux
The aim of each Tableau will be
to show aquaria being used in inter-
esting and decorative ways to con-
form where possible with the theme
of the AQUARIUM SHOW: Fish-
keeping in Home, Garden and School.
Arrangement of each Tableau is to
be left to the ingenuity and inventive
ability of the entering Society,
according to the provisions set out
on this page.

Visitors to the AQUARIUM
SHOW will be invited to vote on
the Tableaux and awards will be

Society Tableaux at the
Aquarium Show

Entry to the Society Tableaux section at the AQUARIUM
SHOW is open to any Society of aquarium-keepers. As the number
of Tableau sites provided must be limited, early application to
enter (entry fee £1) is recommended and in any case application
should be made before 31st July, 1968. Tableau entries will
be accepted in order of receipt of application at the Show
Organiser's Office (554 Garrett Lane, London S.W.17).
The Tableau is to be made on a plinth (3 ft. 6 ins. above floor level)
that will be supplied for a Society's use at the Show.
The area provided for a single Society's Tableau on the plinth
will be 8 ft. by 3 ft., viewable from three sides.
The Tableau should not exceed 4 ft. in height above the surface
of the plinth (a back board 4 ft. high will be provided).
The maximum size of aquarium to be used is 36 in. long and
the minimum size is 18 in. long (all tanks to be supplied by the
Society).
The Tableau must include at least two fully furnished
aquaria and one of these (24 in. by 12 in. by 15 in.) can be
ominated (if desired) as an entry for the Furnished Aquaria Class
of the Show (additional entry fee 5s).
All aquaria in a Tableau must contain some form of furnishing
suitable for the occupants of the tanks.
Heating and lighting for the Tableau is to be supplied by the
Society and this must be arranged with full observance of electrical
safety.
Only non-flammable materials should be used, as far as this is
feasible, in a Tableau.
Features other than aquaria (such as a miniature 'water garden',
for example) and exhibits of an instructive nature with reference
to the fishkeeping theme can be incorporated into a Tableau to
add to its overall attraction or interest.
In Brief
Continued from page 127

Furnished Aquarium Judging Guide. The Individual Fish Standards Guide has already been published. Copies are available from the general secretary, I.M.S.S., 23 Canfield Gardens, London, N.W.6 and should be of interest to judges and exhibitors alike.

OVER 40 members of BOURNEMOUTH A.C. gave a specially warm welcome to the club’s president, Mr Jim Scott-Morgan who attended the April meeting after an enforced absence of several months. The club was gathered to hear a talk by Mr Terry Gledhill of the Freshwater Biological Research Association, which proved very informative and enjoyable (Mr Gledhill is also chairman of Poole & D. A.S.). Mr Wise won the guppy class at the table show of the month (2 and 3, Mr J. Scott-Morgan); and judge Mr R. Matley awarded the first place in the fancy goldfish (owner-bred pairs) class to Mr Coombes.

... A MOST interesting talk A.3 general fishkeeping was given by Dr R. D. B. List to members of MID-HERTS A.S. Later in the month a table show, judged by Mr Dixon of Dunstable, took place. Results of the week were as follows:
Labyrinthis: 1 and 3, Mr P. Barnard (thicklip gourami, 83 and 84 points); 2, Mr R. Savage (thicklips gourami, 83). Chanae: 1, Mr E. Williams (Bolingare's tetra, 84); 2 and 3, Miss A. Wiltshire (oryzias tetra and 85). Novice breeder: 1, Mr J. Scott-Morgan (guppy, 85); 2 and 86. Novice breeder: 2, Mr D. L. Hunter (81, 86); 2, Mr J. W. Lucas (81).

... OFFICERS of KINGSTON & D. A.S. for the year are: chairman, Mr D. Stewart; treasurer, Mrs R. Greenhal, secretary, Miss P. Greenhal (39 Garth Close, Morden, Surrey); show secretary, Mr G. E. Greenhal, competitions club, Mr M. Bartley, Mr B. J. Pawley; press officers, Mr C. Harrison, Miss P. Greenhal. The Society meets at the Lake’s C. C. of E. Primary School, Elm Road, Kingston, Surrey and the secretary will be pleased to supply further details to interested fishkeepers.

Dates for Your Diary

8th June. SOUTHAMPTON & D.A.S. Open Show. St. Denys Hall, St. Denys, Southampton. Schedules from Mr D. A. Gibbs, 57 Wavell Road, Bitterne Lodge, Southampton.

8th June. LLANTWIT MAJOR A.S. Open Show. Schedules early May from Mr J. Sanders, 36 Sandford Road, Aberkenfig, Bridgend Glam.

8th June. CATFORD A.S. Open Show. Details from Mr K. Owen, 196 Laughway, West Wickham, Kent.

8th June. THIRD INTERNATIONAL GUPPY SHOW. Organised by the FANCY GUPPY ASSOCIATION. The Drill Hall, 5 Streetford Road, Manchester (address St. entrance). Benching 4:30-7:0 p.m. 8th June, Open Sunday, 10 a.m.-5 p.m. Schedules from Mr R. Bresford, 99 Valley Road, Arden Park, Birkenhead, Chester.

9th June. GLOSSOP A.S. Open Show. Schedules from Mr E. Tomkinson, 16 July Street, Glossop-St. Medlock, Manchester.


11th-15th June. NATIONAL FURNISHED AQUARIUM EXHIBITION at St. George’s Hall, Bradford 1. Entry open to all.

15th June. 3 DAYS A.S. first open Show. Grass Royal Show. Yeovil, Details from show secretary Mrs T. Gillard, 42 Crofton Avenue, Yeovil.

15th June. THREE COUNTIES annual Open Show. Walsall, Blackwell, Birka, Show secretary, Mr T. B. Bunting, 40 Pondmoor Road, Blackwell, Berks.


THE AQUARIUM SHOW

19th June. SWILLINGHAM A.S. Open Show. St. Albans, Station Road, St. Albans, Schedules from Mr R. Brierley, 50 Station Road, St. Albans.

23rd June. LEAMINGTON & D. A.S. Open Show. Trinity Hall, Trinity St., Leamington. Schedules from Mr Bishop, 15 Wellington Road, Leamington Spa, Warwick.


23rd June. ALFRETON & D. A.S. Open Show. George Hotel, Chesterfield Road, Alfreton. Schedules from Mr S. H. 32 South Street, Riddings, Derby.


29th June. HUTTON GRAMMAR SCHOOL A.S. third Junior Open Show. Preston, Lancs. Details from show secretary Mr D. J. Radcliffe, Kindu, Todd Lane South, Lostock Hall, Preston, Lancs., PR5 5XE.

29th July. TADCASTER & D. A.S. Open Show. Roman Catholic School, St. Joseph’s Street, Tadcaster. Details from Mr R. M. Greenhal, Statham Grove Longton, Preston, Lancs.


13th July. BARGINGSTOKE & D. A.S. annual Open Show. Central Hall, Bargingstoke, Basingstoke. Benching up till 11 a.m. Open to public after 2.30 p.m. Schedules from show secretary, Mr A. Marshall, 61 Farnham, Basingstoke, Hants.

13th July. GOLDFISH SOCIETY OF GREAT BRITAIN quarterly meeting. Details from Secretary Mr W. L. Williams, 57 Constable Gardens, Edgware, Middlesex.

14th July. ROMFORD & BEACONTREE A.S. Open Show (Dagenham Town Show), Enquiries to Mr J. M. R. Frye, 3 Ashvale Drive, Cranham, Essex (phone Upminster 88431).

14th July. BOURNEMOUTH A.C. Open Show. Kinson Community Centre, Pelham Park, Kinson. Show schedules and entry forms arrive end May from show secretary Mr J. V. Jeffery, 70 Bannister Avenue, Southbourne, Bournemouth.

14th July. MEDWAY A.S. Open Show. St John Fisher School, Chatham, Kent.

21st July. CLEVELAND A.S. first Open Show. I.P. Rooms, Fountain Street, Grimsby. Schedules from Mr D. B. Stone, 22 Queens, Grimsby.


27th July. EAST LONDON AQUARIST FONDKEEPERS ASSOCIATION Open Show. Ripple Road Fish School, Ripple Road, Romford, Essex. Benching 6.30 p.m. Friday, 24th-5th A.M. 27th July. Mr J. Smith, Hatch Grove, Chadwell Heath, Romford, Essex.

27th July. E.P.T.F.S. Badge of the Month

Ellesmere Port Tropical Fish Society

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Classified ADVERTISEMENTS

AQUATIC SUPPLIERS

LOWEST POSSIBLE PRICES. South East London’s largest aquaria. Over 100 tanks containing numerous varieties of fish. Retail and wholesale. 24 x 12 x 12 in. polycoated tank complete with heater, thermostat and thermometer, 65s. Neons, tiger barbs, 5 for 10s; angelfish, platys, 4 for 10s; many other bargains. Propo's waterfall and fountain pump complete, £5 19s 6d, plus 7s 6d p.p. Plants, fish and equipment sent by post and/or rail. Regret callers only for tanks and ponds. Please send s.a.e. for lists of fish and plants etc. to Lee Aquarium Centre, 266 Lee High Road, Lewisham, S.E.13 (A20 road between Lewisham and Lee). Phone LEE 5191.

KINGSWAY SPORTS, 199 High Street, Barking. Tropicals, aquaria, accessories, plants, live food.

TROPICAL AND MARINE FISH. Fresh supplies weekly. Plants, tanks and accessories. Ronada Ltd, 153 Queen’s Rd, Blackburn (phone 57654). Opposite Queen’s Park Flats. Open daily, 9.30 a.m.—6.0 p.m.; Friday 8.0 p.m. Closed all day Monday.

OLD BURY’S OF CHESTER. 100 varieties tropical fish, freshwater and marine. 40 varieties plants. Equipment. Live foods. Evenings after 7 p.m. Weekends 2 to 6 p.m. 36 Pearl Lane, Vicars Cross, Chester 41671.

NOW AT NEW PREMISES—BETTA PETS, 28 Watery Lane, Preston (phone 27155). Specialists in tropical, marine and coldwater fishes. 43 tanks on display. All equipment and accessories in stock.

NORTHERN IRELAND. Breeders of tropical and coldwater fish and plants. All equipment supplied—Mr Alfred Robbins, Grosvenor Tropicals, 88 Woodstock Road, Belfast.

PLYMOUTH TROPICALS for your fish, plants and equipment. North Hill Nurseries, Tavistock Road, Plymouth. Phone 62663.

CLASSIFIED ADVERTISEMENTS


OVER 120 VARIETIES tropical, marine and pond fish—for personal shoppers only. Kingfisheries, 308 Croydon Road, Beckenham, Kent. Phone 0-650 3716. Closed Wednesdays.


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RUSTPROOFED aquaria, ornamental stands, glazing cement. Equipment manufacturers. S.A.E. Westby’s, Barton, Ormskirk.

SHEERDERS. Made of stainless steel, the Shredders are the only instruments capable of reducing earthworm, white worm, meat, etc. to a size suitable for youngest fry. Price 21s., plus 1s postage. BLANKET WEED REMOVER. In stainless steel, most effective removing blanket weed from plants without damage. Price 3s 9d, plus 9d postage. E. S. Walker, 145 Bure Lane, Christchurch, Hants.

LARGE AQUARIA, FRAMES, SHADES, STANDS. 1 x 1 x 4 4 in. steel angle: 36s x 12 x 12 in. 28s; 36s x 15 x 12 in. 29s. 1 x 1 x 4 4 in. steel angle: 42s x 15 x 12 in., 42s; 42s x 18 x 12 in., 45s; 42s x 15 x 15 in., 45s; 48s x 15 x 12 in., 49s; 48s x 18 x 12 in., 49s. Two-tier stands: 36s x 12 x 33 in., 50s; 42s x 12 x 33 in. high, 57s; 48s x 12 x 33 in., 62s. 48s x 15 x 33 in., 67s. Aluminium shades: 36s x 12 in., 30s; 42s x 12 in., 37s; 48s x 12 in., 42s; 48s x 15 in., 45s. 7¼ sealed tin aquarium glazing compound 15s. 14½ tin 24s. Shades, compound, sent only with frames or stands. Any size to order. S.A.E. carriage paid. Money back if not satisfied. Hockney Engineers, Derwent Place, Sweet Street, Leeds 11. Phone 25661.

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<th>£1 (one pound)</th>
<th>$2.40</th>
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| 1s 6d (or 1/6) | $0.18 |
| 5s 6d (or 5/-) | $0.60 |
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| £1 17s 9d (or £1/7/9) | $4.53 |

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**CAMBRIDGESHIRE**
- Honesome Aquatic Nursery (Chatteris 2418)
  - Honesome Road, Chatteris
  - M T Th S Sun 9-5 W F 9-10 p.m.
- Trop F Plants Pond F Equip

**CO. DURHAM**
- Waterworld (Hartlepool 66132)
  - 103a Park Road, Hartlepool
  - M T W Th F 2-7 S 10-6
  - Trop F Rep & amphib Marinas Plants Equip (Whol & Ret)

**DERBYSHIRE**
- Terry J. Aquatics (Derby 21335 & 23716)
  - 129 St Thomas Road, Derby DE38RH
  - M T W Th F 2-8 F 9.30-8 S 9.30-7.30 Sun by app
  - Trop F Plants Equip

**HAMPSHIRE**
- Atlantis Aquarium (Bournemouth 53593)
  - 449 Wimborne Road, Winton, Bournemouth
  - M T Th F S 10.30-6 W Sun 10.30-1
  - Trop F Pond F Plants Equip

**LANCASHIRE**
- Kelly’s Pets Unlimited (061-223 3494)
  - 212 Ashton New Road, Manchester 11
  - M T Th F 10-6 F 10-8 S 10-5 Closed W
  - Trop F Plants Equip

**LEICESTERSHIRE**
- The Boot Aquaria (Leicester 27788)
  - 198-200 Belgrave Gate, Leicester
  - M T Th F 10-6 Closed W
  - Trop F Pond F Plants Equip

**LONDON**
- Johnson’s Aquarium (01-672 6742)
  - 223 Longley Road, Tooting, S.W.17
  - M T Th 10.30-1 2.15-6 F 10.30-1 2.15-6.30 S 10-6 Closed W
  - Trop F Plants Equip Foods Marinas Ponds Pond F (Whol & Ret)

**NOTTINGHAMSHIRE**
- Nottingham Aquarium (Nottingham 75925)
  - 65 Birkins Avenue, Hyson Green, Nottingham
  - T Th F 10-12 2-7 W 10-12 2-6 S 9.30-6 Sun 10-1
  - Trop F Plants Pond F Marinas Equip

**STAFFORDSHIRE**
- The Aquarium & Aviary Co. (Lichfield 2405)
  - 19 Bore Street, Lichfield
  - M T Th F S 9-5.30 W 9-1 Sun 10-1
  - Trop F Pond F Marinas Rep & amphib Plants Equip

**SURREY**
- Egham Zoo (D. L. Runsey) (Egham 4607)
  - 61 High Street, Egham

**SUSSEX**
- Conrad A. Dowling, Aquarist (Lewes 3970)
  - 1 St John’s Terrace, Lewes
  - M T W S 9-6 Th 9-1 F 9-8
  - Trop F Pond F Rep & amphib Plants Equip Ponds

**SCOTLAND**
- Aquascene (Blantyre 2307)
  - 84 Calder Street, Blantyre, nr. Glasgow
  - M T Th S 9.30-6 Closed W F 9.30-8 Sun 12.30-5.30
  - Trop F Pond F Rep & amphib Plants Equip Books

- Wilsons of Glasgow (Glasgow South 2891)
  - 60 Carlton Place, Glasgow C.5

**N. IRELAND**
- Castle Aquatics (Belfast 56088)
  - 78-80 Castlereagh Road, Belfast 5
  - M F 9.15-8 T Th S 9.15-6 W 9.15-1
  - Trop F Pond F Rep & amphib Marinas Plants Equip

**WALES**
- Aquarium (OSW 2.55806)
  - 9 Dillwyn Street, Swansea
  - M T W F S 9-6 Th 9-1
  - Trop F Pond F Rep & amphib Plants Equip

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