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Photo by Tetra Werke, Melle, W. Germany



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Comments and Quotes

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Live Corals Earn their Keep

ADVOCATES of the 'natural system' of marine aquarium-keeping who include living corals as a vital part of the set-up tank consider that the algae found within the corals have an important oxygenating role to play. The microscopic algae (zooxanthellae) produce oxygen in the light as part of the process of photosynthesis, the feeding process common to all green plants. Since the living corals use oxygen it might be thought that the algal provision of this gas would be an advantage to the coral but not to much else in the tank. Some specially precise measurements have now been made in Pacific reef-forming stony corals that prove the worth of the algal contribution of oxygen.

Dr B. Roffman, a zoologist of the University of Georgia, U.S.A., used polarographic electrodes and a recording potentiometer to measure oxygen usage by the corals and oxygen production by the algae living symbiotically with these. The measurement showed that the rate of oxygen production was between two and five times the rate at which oxygen was consumed. An interesting further observation was that prolonged exposure of the corals to light resulted in a decrease in the rate of oxygen production, and that for some species the maximum rate occurred when the light was approximately half the full intensity.

Study of the biology of corals is really in its infancy and there undoubtedly remains a lot to be learnt that will be of interest to and applic-

able for the tropical marine fishkeeper. In January of this year, scientists from many parts of the world attended a Symposium on corals and coral reefs held in South India under the auspices of the Marine Biological Association of India. The scientists were able to visit Indian reefs as well as discuss their work together. One report that was given at the Symposium added a further note to the observations about coral algae mentioned above. Evidence had been obtained by one zoologist for the transfer of materials, made photosynthetically by the algae, to the skeleton and tissues of the coral. It appears that the corals really are on a good thing in harbouring their tiny green companions.

A Bed of Guppies

THE suggestion recently made by a *PFM* contributor that guppy varieties should be named after their originators in the way that new roses are named by rosegrowers has drawn some sharp comments from several readers. It seems that things really are somewhat different in the world of horticulture, and we noted only the other day that as a prize in a competition being run by a women's magazine there was being offered a 'new', 'specially bred' rose that would be named after the winner! Even if there were as many guppy followers as there are cultivators of the rose we doubt whether acceptable new guppy varieties would come to the fore with the readiness that the above offer appears to indicate is the case with roses.

Psst—Need a Fix?

IF it wasn't that it was destined to be priced out of the market as an aquarium remedy quinine would now be likely to become sought after in the kind of way that would make aquarists appear to be trafficking in illicit drugs. This is because the compound has ceased to be available to manufacturers of remedies and can be dispensed and issued on prescription only by qualified pharmacists. It's a pity that this old standby for the treatment of community tank outbreaks of white spot has become so expensive and so hard to come by, but quinine is a substance that always had to be used with a degree of understanding, and concern for its unstable nature in solution, if success

was to be obtained readily with it. Fortunately, its virtual disappearance from our remedy cupboard does not leave us completely without an answer to white spot.

Taped Society Programmes

OUR note on 'Material for Meetings' in last month's issue has produced a number of comments in favour of the idea presented in the note that tape recordings could be made available for inter-society use on a really large scale if a sufficient number of clubs were to participate in the venture. In particular we have received an enthusiastic and constructive letter from Mr Ray Holmes, vice-chairman of Peterborough Fish-

keepers' Association—unfortunately too late for inclusion in this month's issue but which will appear in PFM for May. We take the unusual step of drawing attention to the 'coming attraction' of a reader's letter because it certainly puts some important practical points and recommendations that need to be considered (type of tape, running speed etc.) before the recording programmes get under way.

Broadtail Moor

IN the list of pointings given for the broadtail moor on page 503 of the March issue of PFM, the figure for points for colour was inadvertently omitted. For colour (black), 19 points are allotted.



Odd Man Out

ABOUT 14 months ago I purchased a pair of *Barbus vittatus*. In July 1968 I noticed two $\frac{1}{2}$ -in. long fish hiding away among the vegetation. They looked like tiny black ruby barbs (golden background, black stripes, black dorsal). They are now $1\frac{1}{2}$ in. long, have several younger siblings and these all, except for three, take after the *vittatus*. Conclusion: several spawnings, about seven survivors.

The three exceptions are: two rhachitic spinal deformations, one with unusual melaniferous characteristics (dorsal, pectoral and anal fins are tinted black). The caudal is normally hyaline. The spot on the caudal peduncle is more intensely black than usual and so is the fleck behind the gills. The body is a slightly deeper silver than his siblings. In spite of its immaturity, this fish could be a sport. Not a mutation, just a sport. Has anybody any ideas?

London, W.13

L. SANDFIELD

Guppies and Roses

I ALWAYS find articles on the guppy of great interest, so naturally read Peter Unwin's monthly contribution to your excellent magazine. However, I was a little surprised to read in the January issue that he advocates additional types to the present number.

I feel that the quality of certain types on the show bench is well below what we should expect from a specialist, when we compare the exhibits with the standards drawn. I realise that a few of the large-tailed

variety are quite good, but, due to having three types of veiltails and the delta tail, it is possible to breed with one type, and one not good enough for its own particular class will take a card in another—all from the offspring of one pair. I would certainly like to see the present standard of guppies improved before adding additional types.

I hardly think the guppy societies can be compared with the Royal National Rose Society, which has a membership of 115,500—16,000 new members enrolled in 1967. I have been a member for 7 years and, apart from attending one or two shows a year (and I try to visit their trial beds in St Albans once a year) that's it. I doubt whether they have a very high percentage of exhibitors. I'm still looking for a perfect yellow rose. I am also still trying to breed the perfect 'veiltail guppy', the original veil or short dorsal veil. I have been trying since 1954.

I think it's true to say that new roses are bred after a number of years' research and hard work by the professional and a new type of guppy by the hobbyist. I find it all very interesting—happy guppy breeding!

Llantwit Major

RICHARD WIGG

Bass Wanted

PLEASE could you tell me where I can purchase decent coldwater bass such as peacock-eyed, rock, diamond and black-banded bass. I may say that I have been an aquarist for some 40 years and I know there are not a lot of aquarists keeping these fishes, though I do. I should very much like to get in touch with anyone who can recommend a source for bass.

With regard to that letter about equipment for marine

Continued on page 7



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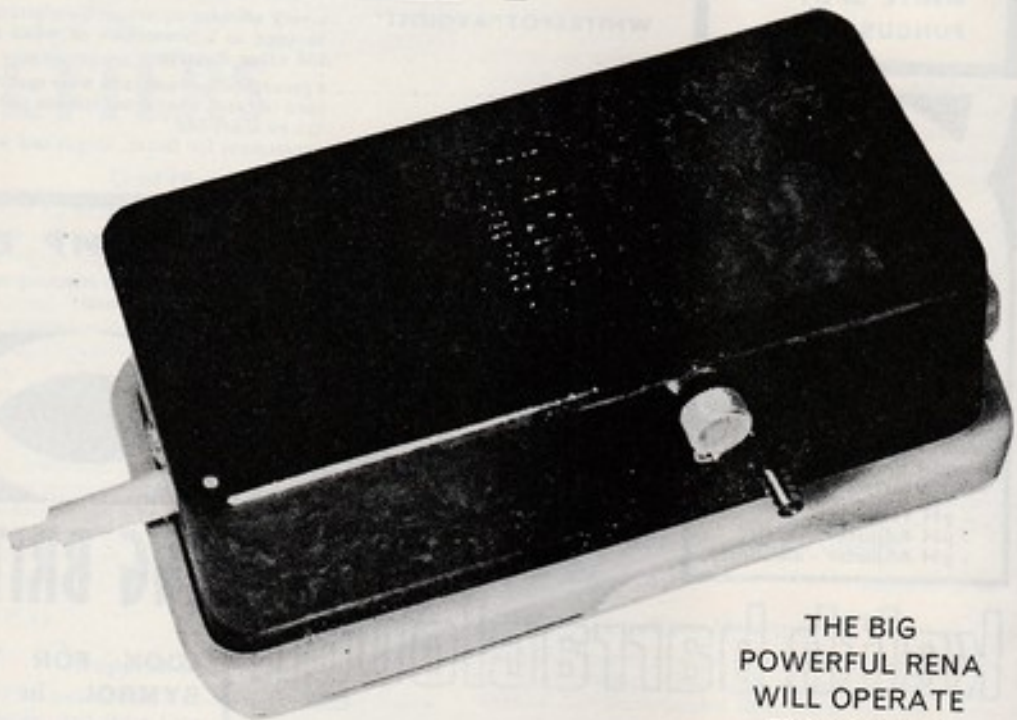
TURN TO PAGES 38 and 43 for other interesting news from K.B. Tropical Fish.

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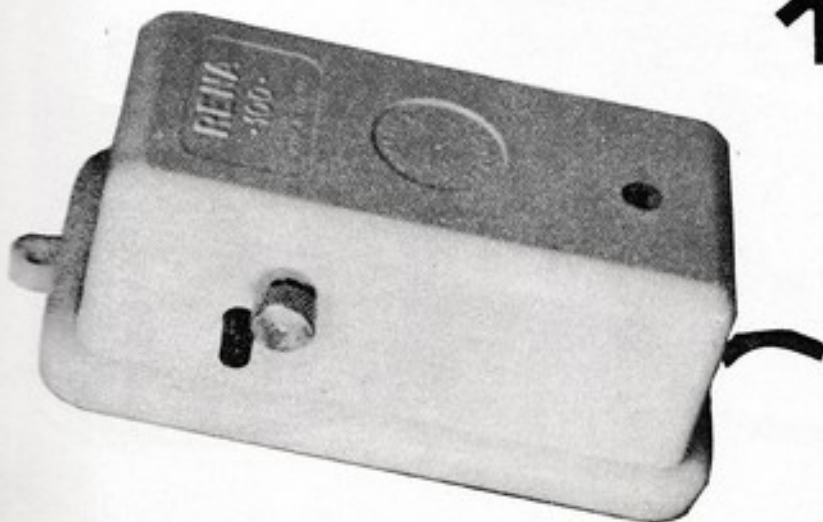
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LETTERS

continued from page 2

fishkeeping. I have known Mr Albert Deakin of Worktop for some years and have taken a deep interest in his marine fish. I would like to confirm that he does everything that he claims with so little equipment.

Shiregreen, Sheffield

E. W. EADON

We have supplied Mr Eadon with the names of some likely trade sources for these fishes, but any further information will be welcomed.—EDITOR.

All-Glass Tanks

AS a regular reader of PFM, I have noted over the past months that reference has been made to the construction of all-glass tanks. In your February issue a reader asked about 3 ft. all-glass tanks. May I offer this information. If any person wants expert advice on this type of work, they should write to Trophy Products, 118 Fouracre Crescent, Downend, Bristol, who are specialists in the construction of all-glass tanks etc. I know from experience that they are only too pleased to help anyone with problems of this kind—often with drawings and step-by-step instructions. They also have a 'sealer' called Trophix which I have used with great success in the making of my own breeding tanks.

Bristol

J. H. LOWE

Should Experts Agree?

IN regard to the feature by Mr A. Deakin in the January edition of PFM and the reply printed by Mr Frank McMenamin in the February issue, whilst being in agreement with Mr McMenamin concerning his views on coloured gravel and artificial plants—views, I might add, shared by the vast majority of serious marine enthusiasts—there are several points in his letter which I cannot possibly go along with.

If, as Mr McMenamin is quick to point out, Mr Deakin's fish survive on a 'very limited diet', then I am sure mine should all have died some 2 or 3 years ago. I am left wondering why they have not, as they are fed almost exclusively on Tetramarin flake food and freeze-dried brine shrimp. I have used these two foods for all but solitary carnivorous species for the last 2 years or so. They receive 'fresh' food only in the form of live *Daphnia pulex* and only about once a fortnight for 3 or 4 months in the summer. No, I'm afraid I for one cannot accept that marines require this, that and the other in the way of variety, for the fact is they do not.

The foregoing remarks incidentally apply to all my tanks, which, believe it or not, are kept at 71-73°F (24°C). Loss of colour in fishes established in a tank is generally caused through adverse water conditions such as a lowering of pH, an increase in soluble excretory

wastes etc. and cannot be attributed to either diet or temperature.

Directly underneath Mr McMenamin's letter we see a request by Mr D Johnson who asks what the minimum requirements are for keeping marines, and whether or not we can get some agreement from the 'experts'. Well, if experts agree, some of them must be phonies or something. May I respectfully suggest to all three of these gentlemen that they join the International Marine Study Society—a group, I can assure them, with very revolutionary ideas on this matter. After all, we can all only go by our own experiences.

London, N.19

G. JENNINGS

International Marine Study Society

Show Statistics

THERE seems to be a tendency to quote the number of fish entered at shows as an index of the show's success. The numbers of entries often is very high but it would be more interesting sometimes to have the number of entrants as well. Is there a restriction on the number of entries per person? Whereas there sometimes seems to be a suggestion that more entries necessarily means the greatest success, the show with more entrants might indicate interest over a wider area. I suppose more entries is better for the club, but more entrants might be better for the hobby.

Worcester

B. DENTON

Favouring Fluorescent

MOST of us start by lighting our aquariums with normal incandescent lamps. These have a number of disadvantages including the large amount of yellow contained in their output and a rather short life, which is due to the horizontal position and humid conditions. A lamp larger than 40 watts may explode if water drips on to it from the cover due to the high operating temperature; 25 or 15 watt lamps are safer but the plants may not grow if the illumination is too low.

The better colour rendering, higher efficiency and longer life (caused by operating in the correct position and low surface temperature not causing explosions) makes fluorescent tubes a good investment. If installing these, remember the choke is designed to operate at up to 70°C and a 3 ft. tank can only be fitted with 2 ft. tubes.

There are at least nine different colour tubes that could be used to illuminate an aquarium but the best is, without doubt, Grow-lux. The rendering of red and blue is very good and the effect on plant growth terrific. I have found one 2 ft. 20 watt tube suitable for a 36 in. by 15 in. by 12 in. tank but some people may prefer a higher level of illumination. These tubes have an output of 330 lumens, which is almost the same as a 40 watt incandescent lamp.

Unfortunately Grow-lux tubes are expensive, mainly because the phosphor used to coat the inside of the tube is a rare element. A reasonable alternative is northlight (sometimes called colour matching). The output of a 2 ft. 20 watt tube is 650 lumens but colour rendering is not so good in the aquarium nor is the effect on plants as dramatic. A white tube has an output of 1050 lumens and is cheaper still but not anything like as effective as the two already mentioned. Other colour tubes may be

suitable, except for warm white. This gives a poor rendering of reds.

My fish are not alarmed when I switch on this type of lighting, as suggested in the article 'More About Aquarium Electrics' in the January issue of PFM. This may be because I take care not to switch them on when the room is in darkness. The advantages of low-voltage lighting seem doubtful to me and the cost of the necessary converting equipment would pay for a fluorescent installation.

I have been using the same 2 ft. 20 watt Grow-lux tubes for over a year now and am certain that the number of incandescent lamps I used in the previous year were almost as expensive. I have used less electricity, one 20 watt tube replacing three 25 watt lamps and had more pleasing lighting in the aquarium. What more can I add?

Bugbrooke, Northampton

D. J. COOKE

Judges and Judging

I WAS surprised to see in your feature 'In Brief' (February, 1969) a statement that a new F.B.A.S. 'A' class judge in the coldwater classes had been appointed. At the time of writing this letter (9th February, 1969), although the aquarist concerned had undergone a test for upgrading, he remains a 'B' class judge until his up-

grading is approved by the G.S.G.B. and ratified by the F.B.A.S. Council. When he becomes upgraded he will be notified by an official of the Council in writing to that effect, and until that time he remains a 'B' class judge.

C. A. T. BROWN

Secretary, Judges & Standards Committee, F.B.A.S.

I HAVE entered a certain fish in three separate shows—the first The Aquarium Show 1968 in London, where it received 80 points. The second was our own Isle of Wight club show in which our own judge awarded it 83 points. I believe him to be a class B F.B.A.S. judge. The third time, last week, was also in one of our own club shows and judged by an independent judge who, I understand, is a class A F.B.A.S. judge. He said that he wouldn't give it house room and awarded it only 52 points. What I would like to know is why three judges can be so different with their results? Could any of your readers give me any explanation of this? I understand that the 5 x 20 points system was used in each case. The fish, in my opinion, was in the same condition throughout, and it took the cup for the best guppy in the show.

Lake, Isle of Wight

R. W. CHAPMAN

GUPPY World

A READER asks me in a letter to define the difference between 'linebreeding' and 'inbreeding'. A geneticist friend of mine once described it thus: 'If you are breeding with your own guppies and aren't introducing related strains, and the results are good, then you are linebreeding; if they are bad, then you can blame it on inbreeding!'

Inbreeding has come in for a lot of unwarranted criticism, when often the real blame should have been placed on the poor parent stock selected by the aquarist. If you doubt that remark remember that pedigree animal breeders have been using inbreeding for hundreds of years. In laboratories, *Drosophila* fruit flies have been in-bred full brother to full sister for three figure generations in some experimental series.

The genetics of the guppy differ slightly from those of many other fishes since with *Poecilia* we are dealing with three factors (affecting colour, finnage shape and body markings); in most other fishes only two of these are relevant. If you were crossing wild tiger barbs, then discounting the rare mutation, you would expect to get fish that emulated their parents in these factors.

By PETER UNWIN

Therefore when breeding guppies, a practical point to bear in mind is not to aim to improve or change your stock in every direction at once. Trying to change too much, too quickly, has been the downfall of too many—and not all were beginners!

The Chinese of old summed it up nicely when they said: 'The longest journey commences with but the first step'.

Who told you that? My male guppy is so old that when he chases a female around the aquarium he apparently can't remember why.

With all the virulence of an influenza epidemic the breeding season is nearly upon us and the cry is once again to be heard: 'If only I had more tanks!'

A visit to the pet stores merely brings us under the influence of new and attractive commodities—equipment that seduces both purse and

pocket and leaves little left for such a basic as a new aquarium. But please don't despair! How would you like as much room for your growing fry as you need and at a price you can afford?

Simply line wooden boxes, old tins etc., with plastic sheeting. Before lining, fill the corners of the box with screwed up pieces of paper, and after lining fasten the surplus plastic sheet over the edges of the box with drawing pins or the spring paper fasteners sold at stationers. The latter have the advantage they do no damage the sheeting should you have need to break down the set-up.

If you are using aquarium heaters to keep the water warm then place them in one of the plastic and metal heater holders that are sold, to keep the heater away from the plastic sheet and prevent it melting.

The question of too many shows and clashing schedules has also been raised in the U.S. At the annual meeting of the I.F.G.A., a motion was proposed by Ralph Fisher that the names of all clubs who planned to hold a show in 1969 should be placed in a hat and drawn. If two clubs from the same city were drawn, the first name out had preference. The meeting saw delegates representing 23 guppy clubs throughout America.

Spawning from the Red-fin Shark

By R. C. ARMSTRONG

Photographs by the author

SOME time ago I purchased twelve red-fin sharks (*Labeo frenatus*), hoping that if they were given the right conditions I would be successful in persuading them to spawn. After a few months of heavy feeding with live foods and tinned spinach the largest shark was just over 4 in. long and the others were around the 3 in. mark, and the fish began to spar up to each other. Three of the twelve sharks moved around the tank together most of the time, a great deal of play and sparring going on. They would swim alongside each other so closely that their sides were rubbing. As I have seen this many times before with sharks I did not take a great deal of notice of it.

The three sharks mentioned began to show very good colour, and the largest of the three I had removed several times to enter at shows (it was the first shark I have had that did not lose colour on the show bench). I placed the three sharks in a 42 in. tank that was well planted, containing water of pH 6.8 and hardness 80 p.p.m. After a few days in this tank the trio resumed their sparring behaviour, so I reduced the amount of light by placing a floating plant in the tank, kept them well fed, and waited. Nothing happened for several weeks. All three were in excellent condition, the largest one showing the greatest colour: nut-brown body with all the fins blood red and the anal fin having a black border. The other two sharks had good colours but their fins did not show the deep red and the black border on the anal fin was less intense. I assumed from this that I had one male and two females, and I thought that the two smaller fish were slightly fatter



Red-fin shark with some of the youngsters developed from the spawning described in the article



Red-fin shark
(*Labeo frenatus*)

in the body, which I confirmed by removing the tank cover and looking down on them from above.

After several weeks in which nothing had happened to suggest a spawning in the tank, I added a flying fox and two sucking loaches to it. After about half an hour all hell was let loose: the sharks were chasing the other fishes all over the tank, but as the flying fox and the loaches were of

a good size I let them remain there. When I next looked the sand that I had used in the tank, to root the plants in (sand rather than gravel to avoid increasing the water hardness), was covering the plants and the water was very cloudy. I connected a large outside filter and pump to the tank and after a time it had cleared the water enough for me to see the dead body of the flying fox and,



The three large red-fin sharks in this picture are the trio that produced a spawning for the author and they are shown together with some of their youngsters

in the background, the two dead loaches. All were stripped of fins and eyes.

I removed the dead fishes and left the filter running for some time, but as fast as I was trying to clear the water the sharks were making it cloudy by shifting the sand to one end. I switched off the filter and lights and left them to it overnight. Next morning I found that the sharks had cleared all the sand and plants from one end of the tank and were acting in an excited manner against one of the glass sides. I carefully removed the tank cover and peeped into the corner of the tank. In the corner on the glass bottom were many glass-clear eggs, with all three fish fussing around them.

Which of the females had spawned? I watched closely for several hours and decided that as I had thought there were two females and it was likely that both had spawned since none was being chased away from the eggs and all three fish were mouthing and fanning the eggs in perfect harmony. Which fish should I leave to look after the eggs? After a long watch I decided to leave all three with the eggs to see what happened.

The filter was not used again but an airstone giving a gentle airflow was placed in the tank; the sharks liked this and took turns to cleanse themselves in the stream of bubbles whilst the others were tending the eggs. After 48 hours (water temperature 80°F; 24°C) the eggs were hatching and the fry were falling to the tank bottom.

The fry did not have yolk sacs, an observation that gave me a headache at the time because I did not know what I was going to feed them on. They began hopping all over the corner of the tank, semi-free swimming, without yolk sacs. I had prepared a culture of Infusoria by the use of apple snails, and as it was a slightly cloudy mixture with not too unpleasant a smell I used it in a drip-feed rigged up in one corner of the tank. The next day the fry were all free swimming, after a fashion, with the parents dashing around scattering the fry in all directions, although upon any movement of the aquarium cover they marshalled the fry back into the shelter of the nearest plants.

After 7 days all was well and I thought that the young sharks were quite capable of looking after themselves. They were then feeding on brine shrimps and once a day I put in a spoonful of a well-known baby food manufacturer's Baby Spinach; what the fry did not eat the apple snails finished off for them.

At 7 weeks the youngsters were about $\frac{1}{4}$ in. long and as near as I could count there were 150 of them. They made a splendid sight as they skimmed their way over the tank bottom. They are now several months old and I am wondering, as I look at them, can I do it again? And what about red-tailed sharks? I shall have a try—has anyone a stock of de-finned flying foxes and sucking loaches to dispose of?

Electrical Equipment in the Fish House

By R. C. TAYLOR, C.Eng., M.I.E.E.

“LET the cobbler keep to his last” so goes the old saying.

Unfortunately it is not practical for the average aquarist to call in an electrical engineer when he wants an electrical layout designing. Yet it must be emphasised that *main electricity and water is an extremely dangerous combination*; we must face up to this fact and take all reasonable precautions. These notes are an attempt to help readers to spot dangers and to ‘design safe’.

The simplest method of ensuring safety is to build a heat-insulated fish house which is warmed by a thermostatically controlled electrical heater of suitable design and with carefully earthed metalwork. The heater is preferably a tubular heater installed under the bottom tanks, out of reach and not within about 3 in. of the

tanks. If the thermostat is not integral with the heater it should be mounted on a wall, not too close to the heater. Be sure that the heater and thermostat are types suitable for use in damp locations. This is work for an electrician.

As a guide to the amount of power required, a fish house that is about a 6 ft. (2 metre) cube with 3 to 4 in. (8 to 10 cm.) of insulation all round, except for ceiling joists, was raised 20°F (11°C) above ambient by 100 watts. Thus it will be seen that little electricity will be required other than for lighting. In fact if individual hood-lights were used the door would have to be left ajar!

If fibrous insulation is used it is important to prevent it becoming wet as then the heat insulation value is much reduced. Fibre glass is non-

flammable; expanded polystyrene burns but it is not greatly affected by damp.

Electric power always travels in circles or at least in complete circuits or loops. Household supplies travel from a near-by transformer, through the Company's fuse, the meter, the main switch and the consumer's fuses to the ‘live lead’ in the house cables. This is the wire that is the most dangerous. After passing through the live lead the current returns in the ‘neutral lead’, which is normally connected to earth at the supply transformer but must not be earthed at the consumer's premises. The domestic ‘earth wire’ is always connected to a good earth at each house; this can be a metallic rising water main or an earth rod. Current only flows in the earth wire under

Electrical Equipment in the Fish House

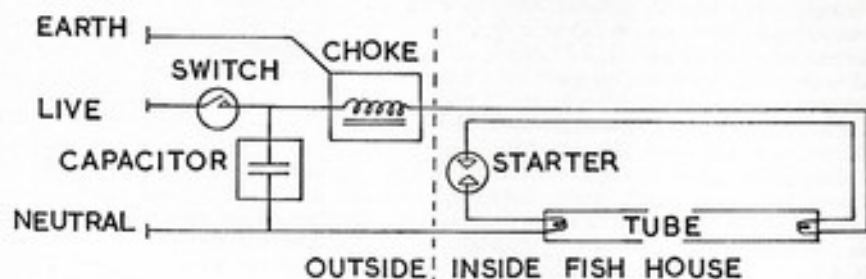


Diagram 1

fault conditions; this is a source of danger as the earth could be disconnected and the load will still operate. However, if a fault develops a very dangerous situation exists as there is no path for the heavy current needed to blow the fuse and thus disconnect the circuit. It is easy for an electrician to check earth effectiveness but if the installation is correctly carried out up to the power socket careful attention to points covered in this article will ensure safety.

As electric power can only flow in a complete circuit it is obvious that a break (e.g. a switch) at any point will stop the flow. However, if the switch or thermostat is in the live lead there is a minimum of live wire when the switch is off; this is the safest and therefore the correct connection.

Fluorescent tubes mounted on the ceiling are the safest lights. The tubes can be mounted in clips and the leads from the connectors should be taken through the ceiling or otherwise kept out of reach until they are outside the humid atmosphere of the fish house, where the choke, condenser and starter, if used, are mounted on a board. The components should be covered to prevent accidental contact but do not enclose them closely as they will become too hot if ventilation is restricted.

Fluorescent lights are rapidly becoming accepted for aquarium

illumination. Various hues are available, and the proprietary Gro-lux tubes are often recommended. To light a normal fluorescent tube it is necessary to heat a filament at each end of the tube by passing a small current through them and then to apply a high voltage between the filaments. If the tube is in good condition it will 'strike'. The heaters will now be heated by the electrical discharge in the tube and the small heating current can be switched off or much reduced.

There are two main methods of achieving these connections. Diagram 1 shows the type of control gear, which includes an automatic switch usually referred to as a 'starter'. When this device first has the supply connected to it, it allows current to pass, thus there is a circuit from the live lead through the choke, one filament, the starter, the other filament and back to the neutral lead. Current flows and the filaments and the starter warm up; after a second the starter becomes an open circuit so the full mains voltage, limited only by the choke, is applied between the filaments and the tube should strike. However, if the tube or starter is less than perfect it is often necessary for this process to be repeated a few times before the filaments are hot enough for the tube to strike. This flashing can easily cause nervous fish to damage themselves by dashing into stones or the tank.

A better type of control gear is shown in diagram 2. This uses an auto-transformer instead of a starter and is thus slightly more expensive. The action is that, until the tube strikes, there is mains voltage (less a very small drop in the choke) across the transformer and a few volts will be produced for each filament. When the filaments are hot the tube strikes and the voltage across it falls; thus the filament voltage falls but does not disappear. This method of striking leaves the filament voltage on until the tube strikes and this usually eliminates flashing. Also the remaining voltage after striking helps to keep old tubes in service and allows tubes to be run at half rating should this be desired.

When a tube is lit it has a very low resistance and if connected directly to the mains it would blow up or blow the fuse. To prevent this a choke is normally used to limit the current, though a resistor or ballast lamp can be used but with loss of efficiency and extra heat. The power input to a tube is almost entirely governed by the choke. If an 80 watt choke is used with a 40 watt tube the tube will run at 80 watts (for a while!). If the auto-transformer type of control gear is used it is possible to reduce the power into a tube to at least one half. This can be useful to control algae without giving the fish too short a day. The simplest method is to connect a second choke, of the same

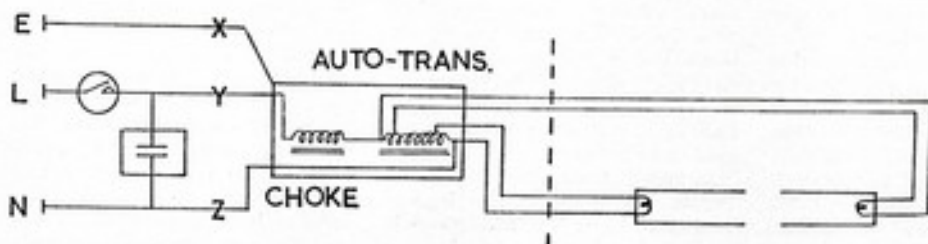


Diagram 2

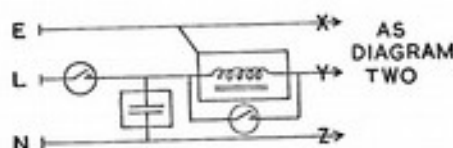
rating as the original, in series. A switch across this choke will give the choice of two brilliancies, though there is a surprisingly small reduction in light for a 50% reduction in electricity consumption (see diagram 3).

Fluorescent tubes must not be connected in parallel. Each tube must have its own control gear. The only exception to this rule is that with suitable equipment two short tubes can be operated in series from one choke.

In a fish house with fluorescent lighting from the ceiling it is not necessary to use cover glasses on the tanks, except to stop fish from jumping out, as with the 100% relative humidity that will rapidly develop evaporation from the tanks will cease and in a clean room no dust will be deposited.

If it is decided, preferably after a

Diagram 3



ing tanks that need higher than normal temperature.

However, two precautions are observed. Arrange the heater supply so that it is easy to switch off, in the fish house by a switch outside away from damp. Also arrange a strip of lead, say 2 in. by 18 in. down one back corner of the tank. The top 2 in. should be covered with plastic tape, except for the extreme end where a bolt should pass through the lead, a 3/16 in. hole drilled in the tank flange and the end of a flexible wire

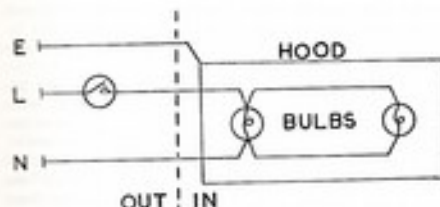
Talking of bubbles reminds me that the air pump should be outside the fish house, as the hot humid atmosphere will shorten the life of the mechanism.

While centred on a fish house most of the comment applies to room tanks. A fluorescent tube mounted on the underside of a shelf over the tank with a hardboard lift-up flap to obscure the light is probably the best arrangement for a tank in a living room. A cover glass will be needed to reduce evaporation and to exclude dust. It is desirable to reduce evaporation, even in a house with central heating, as when water is added to a tank it should be after removal of old water, not to replace evaporation, otherwise the condition of the water will rapidly deteriorate.

All wiring in a fish house should be carried out in 3-core rubber or plastic insulated cable; a suitable British wire size is 23/0-0076. Joints such as those necessary to connect up a tank heater and thermostat (diagram 5) should be carefully twisted and taped individually with plastic electrical tape; the joints are then laid together and are taped overall. The best arrangement is to strip off the outer sheathing of the cable for 6 to 9 in. (15 to 20 cm.). The live and neutral wires are then cut off until about 2 in. (5 cm.) remains; the ends of these are stripped for 1/2 in. (2 cm.) and are laid parallel with the wires from the heater and thermostat, the two are then well twisted and the twisted part is doubled back in the centre of the twist. This reduces the chance of sharp wire ends sticking through the tape. The twists should be carefully covered with plastic electrical tape separately and then be laid together and taped overall. The cable colour code should be observed; the present British practice is red live, black neutral and green earth or ground. (In the future there will be a change to the European standard which will be brown live, light blue neutral and yellow/green striped earth.)

While on basic topics a few words on the correct fitting of a plug to a

Diagram 4



trial of fluorescent lighting, that it is essential to have individual tank hoods with lights we are really entering the danger zone. Each hood must have a 3-core lead with a good earth connection as diagram 4. The worst danger period is just after the lights are switched on and before the heat has had time to dry-out the insulation. Also each tank must have a cover glass as without this there is always the chance of splashing water on to the bulb or of dropping the hood into the water.

An even greater hazard is the usual glass tubular heater and thermostat. The dangers are mainly breakage of the glass tube when catching a lively fish or cracking of the insulation on the wires. This is greatly accelerated if ultraviolet light or ozone is present. I recognise that such heaters and thermostats will continue to be used, in fact I use them myself for such purposes as display tanks away from the fish house, or hospital or breed-

connected to a good earth. If the tank is painted a small area should be cleaned to ensure a good contact to the metal; a spot of paint after tightening the nut will prevent rust. In a plastic-coated tank in good condition the lead can be a little longer and be folded down the back of the tank to connect to the earth wire by a bolt and washers or by soldering, no connection to the tank being needed.

These precautions ensure that if a suitable fuse is installed in the heater supply, e.g. 2 amps, should there be an accident the earth wire will provide a better path to earth for electricity than will the aquarist and the fuse will blow. Even if the wrong fuse were fitted a mass of non-poisonous (but explosive) bubbles would be released, thus giving warning that the tank water was 'live'. Nevertheless, always switch off the heater supply before putting your hands in the water.

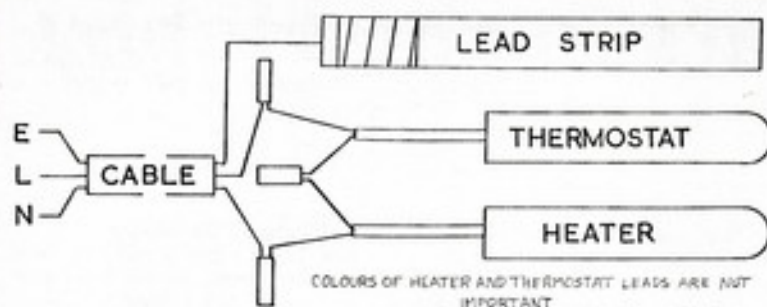


Diagram 5

flexible cable may be considered appropriate. The points to observe are the colour code, cable anchoring and fuse rating. We have listed the colours. The pins of any British 2, 5, 13 or 15 amp 3-pin plug can be identified by looking at the front of the socket with the largest pin (the earth) at the top. The neutral is then on the left and the live on the right. The outer sheathing of the cable must be well gripped by the cable grip in the plug. Usually this is a strip of fibre with two clamping screws. If the cable has a plastic sheath it is desirable to put one turn of fabric base insulating tape round the cable under the clamp to improve the grip. After clamping the cores are connected to the correct pins; if possible leave the earth a little longer than necessary so that if the cable is pulled out of the plug the earth is the last wire to break.

In a plug fitted with a fuse it is important to fit the smallest rating that will carry the load. Usually this

is 2 amp for tank heaters, 5 amp for lights and 5 or 13 amp for space heaters. The modern 13 amp plug is very convenient as it provides a ready means of separately fusing each circuit. Usually 13 amp plugs are arranged on ring mains, i.e. a cable leaves the meter board, runs round one floor of a house and returns to the meter. As many 13 amp sockets as required may be connected to this one loop of cable.

It may not be practical to run such a loop to a fish house. This case, however, is covered by a regulation that permits one or two sockets to be connected to a spur or tee connection from a ring. Thus a twin 13 amp socket could be installed near the fish house and connections for all heaters be connected to one while lights could come from the other. A suitable circuit arrangement is shown in diagram 6. A time switch is very useful for the lighting circuit; some types plug directly into a 13 amp socket so require no extra wiring.

In the junction boxes all blacks go to one terminal, all reds to another, all greens to the third terminal. If there is a fourth it is not used. All these connections are outside the fish house so each load has its own cable feeding into the house. This uses several yards of cable but this is a low price to pay for safety.

A few hints on electrical matters may be of interest.

Normal bulbs have a much reduced life if run horizontal; if this is essential try to get heavy duty bulbs from a large stockist.

Nearly all the electricity used for 'light' actually appears as heat, even with the more efficient fluorescent lighting. Thus apart from the cost of tubes it costs very little to light a fish house as the heaters will turn off an amount corresponding to the heat produced by the light.

Fluorescent lights are best when on for long periods; for lights switched on and off frequently bulbs are better.

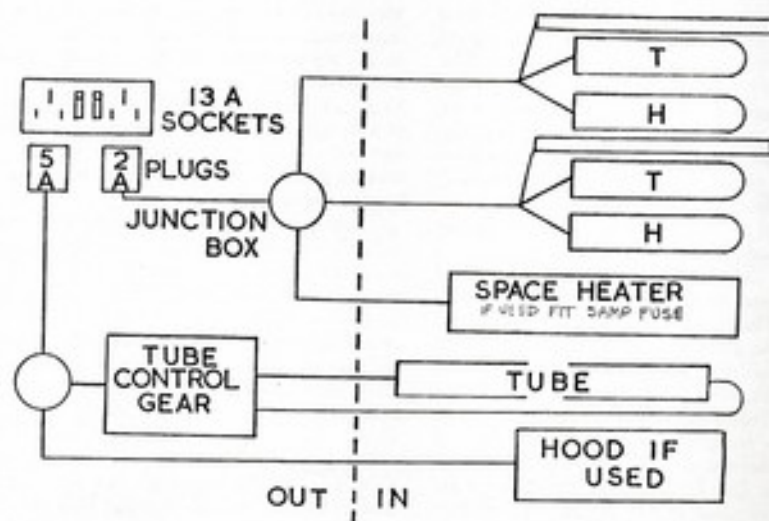


Diagram 6

Fifty Years in the Hobby

A veteran aquarist recalls 'the good old days'—or were they?

THE good old days; a remark we so often hear and one used in connection with every sphere of life. In many cases it is perfectly true, but when applied to the aquarium hobby I have my doubts.

Today the aquarist has everything to make aquarium-keeping easy and trouble-free: many types of tanks, dozens of fish remedies, hundreds of fish foods, and unlimited forms of appliances that will perform almost any function it may be necessary to carry out. Add to this the fact that several hundred varieties of fishes and a very large selection of plants can be obtained at very reasonable cost, that would have meant Utopia to the aquarist 40 years ago.

I am not saying that all this is necessary or even that everything will do what it is claimed to do, but I do think very few present-day aquarists realise just how lucky they are, and I think that some details concerning the conditions of the hobby around the early twenties may amuse and be of some interest to recent comers to the hobby.

When I started to keep tropicals about the end of 1919 the aquaria available were made of zinc angle and had zinc bottoms. There were also a few all-glass tanks on the market but these distorted so much that it was impossible to see much in the tank. The zinc-framed tanks, although quite good for a time, gave trouble when the plant roots reached the zinc bottom, a chemical action being set up that caused all the plants to die suddenly. The larger sizes were very prone to leaks, owing to flexibility of the thin angle used. Some aquarists, with the ability to do so, made their own tanks with wood for the framework, and some fine examples of craftsmanship were to be seen among them. It was not long before the angle-iron tank that we know today came along and it has been popular ever since.

Electric heaters being non-existent, heating was done by means of oil lamps or gas jets under the tanks, the former requiring regular attention if the whole house was not to be filled with fumes and smell. Owing to the difficulty in control, many fishes were cooked from time to time. One has to think for a moment to realise some of the difficulties under which the early aquarists worked; even so these did not deter them and their ranks steadily grew and have been growing ever since.

The first electric heater (German) was quite something. It consisted of a metal tube about 2 inches in diameter, containing the element, and a smaller tube joined at right-angles containing the leads. These worked quite well and cost around a pound; now you can get much better heaters for half this price. Thermostats were very expensive luxuries and most aquarists relied on switching the heaters on and off according to circumstances. Good old days? You really think so?



By L. B. KATTERNS

Then the idea that aeration would solve all problems took shape. Motor-tyre inner tubes pumped up and the air released slowly via a small tube to the bottom of the tank, miniature gasometers made of a large and small oil drum performing the same operation, and the idea of having a small tank above the aquarium and a small pipe taking air and water to the aquarium below—a few months with any of these contraptions and it was generally decided either that aeration was not necessary or not worth the bother involved.

It was not long before the small vibrator pump made its appearance, but some of the early models gave the impression that they had been designed to shake the house more than for an output of air. With the improvement in the pumps, filters made their debut and continual development has taken place up to the present time when we have so many types available that it is sometimes difficult to decide which is the best appliance for our particular purpose.

The only foods that could be bought in the early days suitable for tropicals were dried daphnia and dried shrimp. You now have the choice of over 800 different foods, all of them better than the shrimp or daphnia. I grant you that some of them are more than 20 times the price, but it is interesting to note that it is only in the food section that there has been such an increase, and even now it is still possible to buy some foods at very reasonable prices.

The plants available in the 'good old days' could be counted on the fingers, and the varieties of fishes were zebras, swordtails and guppies, the last two being totally different from what we know today; only the green swordtail was known and these were mostly with bodies over 4 inches. I saw one at a show around 1924 that

measured 6½ inches, not counting the tail. The guppies were also larger than the present-day specimens but had little or no colour at all.

It is in the transport of fishes that the greatest strides have been made. They used to travel by boat and train and were contained in large cans packed round with paper and cotton wool, and fishes coming from the continent were usually 2 days in transit. It was no uncommon event for the shipment to be a total loss. It was sometimes possible to have the fishes put in charge of an individual on the boat to see that they were kept warm, but even under these conditions losses were around 75%. All this, coupled with the fact that only a limited number of fishes could be put in the can, made the actual cost of the fishes very high. In many cases the cost was much greater than the present-day cost of the same fish. The late Mr A. Derham and myself were to the best of my knowledge the first to try shipping fishes by air, an idea which taught us much and cost us a great deal of money.

In those days the air lines were not interested and treated our fishes in the same way as other goods and placed them in the unheated part of the aircraft, resulting in the fishes being frozen within a short time of leaving the ground.

We managed to get this point rectified after some months, but it still did not solve the problem of sending many fishes in one can, and the high freight cost helped little in reducing the price of the fishes. The polythene bag filled with oxygen coupled with real interest on the part of the air lines changed all this.

The new conditions enabled five times the number of fish to be sent in half the quantity of water, with a reduction of losses to less than half of those to which we had become accustomed. Hence the fact that you now have an almost endless variety of fishes to choose from at lower costs. Do not let all this make you think that for the present importers everything is plain sailing. Their risks are still great and many thousands of pounds are risked by them to bring you new species from the other side of the world; it is due in no small measure to these people that the hobby has grown to such vast proportions today.

I think that perhaps the greatest advantage that the present-day aquarist has is in the treatment of disease. All we knew at one time was to use salt and raise the temperature. Now there are remedies for almost every disease and most are quite efficient. When next you pay the few shillings for one of these medicines, just think how many fishes must have been lost in reaching the formula on which it is based. My own puny experiments cost me many thousands of fishes over the years, and when I hear someone moaning because they have lost a fish (often through lack of sheer common sense) I wonder what they would have done 30 or 40 years ago. In most cases the answer would be 'give up the hobby'.

In the good old days I lost a lot of money, had many sleepless nights and spent many hours freezing at airports. Do I regret it? Not on your life. I have had many hours of pleasure, have learnt much and above all have had the privilege of meeting and enjoying the friendship of some of the nicest people on earth.

Transatlantic TOPICS

By JIM KELLY

GOLDFISH have come a long way since they were fair trade for old clothes and competed with the rag and bone man's balloons, but despite an enthusiastic following, coupled with the fact that they are, after all, believed to be the first fish species kept in captivity, they never seem to have commanded the attention of the majority as enjoyed by other tropical species.

Even in the price war, when the prices of other fish and equipment have soared like a well-planned space probe, *Carassius auratus* have remained static in America, so fixed you could count the price increases on one hand and ignore the trigger finger.

In the year 1927, a citizen of Uncle Sam's could have purchased a Chevrolet car for 600 dollars, or 100 2 in. fantail goldfish for about 15 dollars.

Forty-two years later, the same 600 bucks wouldn't even insure the said automobile, but—the goldfish? Just about the same price as they were in the reign of our King George the Fifth!

* * *

Looking for something different to add to the normal show routine? Then take a leaf out of the book of The San Gabriel Valley Guppy Association. They are going to run a Futurity sweepstake, at the Pan Pacific Guppy Championships, 24th and 25th May.

The handout, sent to me by their nearest thing to perpetual motion, show chairman Midge Hill, states that the class is open to anyone with confidence in their guppies. The would-be exhibitor must nominate his entries before they have reached show prime and the fish despatched to the Society 6 weeks before show time (deadline for entries 10th April). It will be possible to make additional nominations up to 18th May, but these late entries must be accom-

panied by a double challenge entry fee of 10 dollars (about £4).

Each entry shall consist of three matched males, female optional and not judged. When entering the breeder must describe the fish nominated for colour and type. Judged as a single class, and contrary to the normal American custom, all colours will compete together in this section. That, plus 42 other classes all for *Poecilia reticulata*, should make this event quite something.

Further information can be obtained by writing to Midge Hill, 9903 Candia Drive, Whittier, California 90603, U.S.A. And Midge tells me they would welcome entries from Britain with open arms.

* * *

The end of 1968 saw the expiration of the Specific Commodity Bill, no. 1024, in the U.S. This piece of legislation controlled the shipping of air freight and the prices charged for flying in tropical and marine fishes.

With the ending of this law it looks as if the cost of air shipment, especially from Asia, will be increased by 90%. This extra cost could be passed on, and means that the hobbyists will pay more for their fishes.

THE AQUARIUM CATFISHES—10

Bumble-Bee Cats and Some Relations



Bumble-bee catfish (*Leiocassis siamensis*) from Thailand

AMONG the freshwater fishes of the world, often are found 'equivalent' families, or individual species occupying similar niches, even in fishes extremely isolated from one another geographically. One of the best examples is in the almost parallel development of sophisticated electro-navigation systems by completely isolated and unrelated fish families on opposite sides of the earth: the Gymnotidae or knife fishes of South America and the Mormyridae or elephant-nosed fishes of Africa.

In the world of siluriform catfishes, the African and Asian family Bagridae seems in many ways almost to be an echo or reflection of the family Pimelodidae of South and Central America, which have already been discussed in this series (PFM, September 1968). Like many pimelodids, there is a typical 'catfish look' about most bagrid catfishes. External similarities between some of the fishes in the one family and certain members of the other are almost startling, even to the practised and experienced collector of catfishes.

Bagrids are usually smooth-skinned, fork-tailed and be-whiskered by either three or four pairs of barbels. In some, all the barbels are rather short, but others such as certain *Bagrus* species may have a pair reaching to the caudal or tail fin. Their size ranges from a few inches to well over a yard, with weights of a hundred pounds in

some giant specimens, and, surprisingly, some of the small *Mystus* species of India have status as being economically important food fishes just as the more Leviathan members of the clan that roam the Great Lakes of Africa. Edibility has been described as everything from excellent to insipid, depending on species and local conditions, although, strangely, Day in his *FISHES OF INDIA* describes some of the more delectable species as

By **BRAZ WALKER**

Photographs by the author

feeding on the foulest material imaginable. Primary groceries for the tribe, however, consist of more ordinary fish staples such as insects, both terrestrial and aquatic, crustaceans, worms and other fishes.

Possibly the most widely available, strikingly patterned and unmistakably identifiable bagrid catfish is known as the bumble-bee catfish, *Leiocassis siamensis*. With alternating and contrasting cream-yellow bands between black to dark-brown wider bands encircling the body and extending on to the fins, it is aptly named.

Like all bagrids of Thailand, the *Leiocassis* species have four pairs of barbels, although there are bagrids else-



Ornate catfish
(*Chrysichthys ornatus*)
from Africa

where with only three. Barbels are rather short in the bumble-bee cat, and the hyaline lobes of the forked caudal each are adorned with a dark spot. A very similar species, *Leiocassis poecilopterus*, is distinguished by having the two caudal spots replaced instead by a band which passes through both lobes. Although nocturnal for the most part, these are very active feeders, which in some instances become rather aggressive toward fishes that are smaller or slower than themselves.

Although the doradid (family Doradidae) catfishes of South America are those generally referred to as 'talking catfishes', a number of other siluriformes are also capable of producing rather startling volumes of sound on occasion. The grunts and groans of the bumble-bee catfish and other bagrids are often heard as 'vocal' protestations for having been removed from the water, but perhaps more surprising are the growling sounds sometimes heard from the aquarium when altercations arise between the bumble bee and some other occupant of the tank.

Among Africa's bagrids, probably *Chrysichthys ornatus* is most desirable for the home aquarium. Not only is this strikingly patterned, dark-and-light copper-coloured fish among the most handsome of medium-sized catfishes, it does not reach the outrageous size with corresponding oral capacity and appetite that characterise some other *Chrysichthys* species.

I recall in the mid-1950s, just after the so-called 'Congo Bonanza' had introduced to hobbyists so many weird and unusual fishes never before available, having seen in THE AQUARIUM magazine a freshly caught *Chrysichthys* species pictured with an African gentleman whose head would rather easily have fitted into the fish's mouth! I also recall at the time suddenly realising the reason for the dwindling fish population in a 7½ ft. aquarium of mine. I had obtained some time before a *Chrysichthys* species under the name 'mother-of-pearl catfish', and it appeared to be the same species as the one pictured. Its retiring nature had kept the creature mostly

out of sight under rocks for some time, but a subsequent check revealed a rather phenomenal rate of growth that was quite explanatory.

One of the more interesting aspects of the bagrid catfishes is the discovery not too many years ago of some quite unusual parental care, at least in some of the larger *Mystus* species of India. Aside from the more ordinary nesting habits employed by many medium and larger catfishes the world over, some of the *Mystus* catfishes seem to prefer actually 'nursing' their young with a 'do-it-yourself' nipple kit. The underside of the parent fish reportedly becomes laden under the skin with a milky, thick substance that is extremely high in protein content, and the tiny fry attach themselves and literally 'hang on by their teeth' while they draw the nourishment through the parent fish's skin and into their own systems.

Day, in the mid 1800s, had noticed that some larger specimens of *Mystus* at times had an unusual texture and roughness to their undersides. This was almost undoubtedly attributable to their having been involved in the raising of young. Some reports are that the underside of the parent at times becomes quite reddened and swollen in spots owing to the gastronomical aggression of their offspring.

There are few problems with this group as far as maintenance is concerned. They are somewhat retiring and almost sluggish at times. Some are large and capable of swallowing quite respectable-sized tankmates, and, until they adjust to the feeding routine, younger specimens especially may require a bit of pampering such as making certain that sizeable chunks of choice food occasionally reach their grasp.

Large, strikingly patterned species such as *Auchenoglanis* are to be highly prized by the avid collector of the spectacular and the unusual, although this is ordinarily a temporary housing arrangement and these species often eventually wind up in a public aquarium where space is less limited and the grocery bill is more easily managed.

QUICK TIPS

- Try using baby rusks as food for your white worm and Grindal worm cultures; the addition of a little yeast to your micro worm culture will work wonders.

- Just a small spot of contact adhesive will secure any outside-fitting thermostat firmly to the aquarium glass and ensure a more accurate temperature control.

- If your worm cultures are infested with insect pests,

place the box beneath a strong light. This will send the worms scurrying to the bottom. Leave it for half an hour, then pass a lighted piece of paper over the surface of the soil mixture two or three times; this should be enough to eradicate even the eggs of these unwelcome visitors.

- A felt marker pen is useful to write pertinent information on the front glass of the aquarium. It can easily be erased by rubbing gently with a small piece of wool or scraping with a razor blade.



Personal COMMENT by ARPEE

FOR me, February's PFM was a most interesting issue. This was principally because there was much food for thought on the subject of the plant troubles on which I wrote in the December, 1968 issue. Mr Rowbotham reports troubles similar to mine and Mr Flinder thinks I should have tackled my disaster more scientifically!

Further on in the magazine was a useful article on the Derivatives of Plants for Aquarium Use, in which the authors touched upon the use of wood and similar decorations from the field for aquatic purposes. I must sympathise with Mr Flinder for being frustrated by my omission to state which wood I had apparently misused, since the same sort of gap was left in the above article. The writers suggested the use of willow, alder, oak or birch, without saying why these were acceptable and why others were not. I omitted mention of the type of wood I had used because I just didn't know: it looked like any of the pieces shown on page 458—it was barkless and had been bleached by the sun for a season at least. A piece lying alongside it had been used in another tank with no ill-effect, but I must confess that I was not too keen to experiment in another tank containing valuable plants until I had investigated other possible solutions.

As the phenomenon has since repeated, in the total absence of any similar material, I can only conclude that the introduction of the wood was not the direct cause of the dieback of the plants, though I must agree that it could have acted as some form of catalyst, and thereby encouraged the reaction. The light sources are Gro-lux tubes supplemented by tungsten striplights, though the latter are not often used. The tanks get over 10 hours' light from the fluorescent tubes each day, but if natural light is above average the amount of artificial illumination is reduced.

I don't really think that light was the culprit, as cryptocorynes don't seem fussy about it unless it becomes overpowering. Before the dieback incident the state of plants was extremely good and a really thriving plantation had become established. I suppose that it is just possible that the subsoil had got 'Cryptocoryne sick', just as some garden soils get 'rose sick' or 'carrot sick' if the same crop has been grown over and over again in the same area of ground. Since the experts cannot quite account for all the bits which make up that particular puzzle, it is not unreasonable to suppose that some similar situation might come to bear under water.

The second dieback was rather less severe than the first, but the plants were correspondingly smaller and the devastation was therefore less of an eyeful than on the

first occasion. If there is a third visitation I shall begin to think we are haunted, but when I look at the tiny plantlets which are the only survivors of what was once a mighty 'forest', I begin to wonder whether they would ever get noticed. If 'sickness' of the environment is, in fact, the cause of all this, then I am afraid that the aquarist is in for far bigger headaches than is the gardener, who normally only has to exchange 'tired' soil for that from another part of the garden. For the aquarist a similar technique would be pretty well impracticable unless his plants were in containers sunk into the sand. Cryptocorynes hate being moved, anyway, so the attempted cure could be as inimical as the disease itself. I shall probably take some cuttings from the surviving plants (if they last long enough), and try them in a tank which has been set up for a much shorter period of time. Although the results would not be conclusive they might point a way.



The correspondence about pH in the December issue was most interesting, and I have a feeling that those who take it seriously will learn a lot from the reports made by enthusiasts in various parts of the country. I am afraid that I have never taken overmuch notice of pH, apart from its widest implications, because the more you get involved in the subject, the more anxious does your fishkeeping become, and as I am an aquarist for pleasure, I have kept it at arm's length. There is no doubt that appreciation of the factor may be quite vital when keeping or breeding certain of the more difficult fishes, or when attempting to define optimum conditions.

What bothers me—and, like PFM's correspondent, I have sat up till well into the small hours in order to try and get my facts right—is the startling and sudden variations which take place for no apparent reason, and with no apparent ill-effect. I have therefore concluded that life is too short to get too worked up if the reading isn't anything like your expectation. It is a different matter if you are engaged on a scientific study, in which case there is no argument at all; here, clearly and strictly defined standards are essential and understandable. For the newcomer to the pH story, however, there is a deal of mystery, largely unnecessary, which can be exploited by the charlatan, and the beginner is well advised to keep the concept in perspective.

Knowledge of pH is extremely useful in arriving at a decision as to what sort of fishes are likely to thrive in your local water. Beyond that, it is generally of little more consequence than the decision to use tungsten or fluorescent lighting. It is a fact, all the same, that lots of beginners get horribly discouraged because their fish are dying at the same time as they themselves are getting more and more confused about pH: they somehow think the two things are connected, but it is much more likely that their failure comes from a chronic attack of the worst of all scourges, common overfeeding.

Brine Shrimp Hatching

By E. J. BYATT

AFTER keeping tropical fish for some years, I have realised many times that one of the biggest problems for breeders is the hatching of brine shrimp eggs. Some months ago, after a particular bout of frustration, I decided to look into the problem and seek a solution. Several magazine articles gave useful tips, but none solved the problem completely.

First, I reviewed my previous attempts, in which mainly two methods were used, and listed the faults.

The first method was to use a commercial hatching kit, which consists of a hatching tray with concentric rings around a central sieve. The tray is covered with a light-tight lid except at the centre where the sieve is situated. The eggs are placed in the outer ring, and the shrimps upon hatching make their way into the sieve towards the light. This outfit worked, but the yield was

low, owing to limited capacity and a tendency for the water to become foul through lack of oxygen; but apart from that the shrimps were separated from shells extremely efficiently.

The second method, advocated by a professional aquatic firm, was to use heavy aeration with a higher temperature (80°F; 26°C). The snag with this method lay in the fact that I always found that some shells sunk to the bottom of the container, while others floated, and no matter how much care was taken (after the solution was allowed to settle, when aeration was stopped) there were always some shells siphoned out with the shrimps. The point that came to light here was the much higher yield.

Up until this stage I was using block table salt for the solution, but after a suggestion from a friend, I experimented with marine salt mixtures and found that their use im-

proved the yield, and the hatching time.

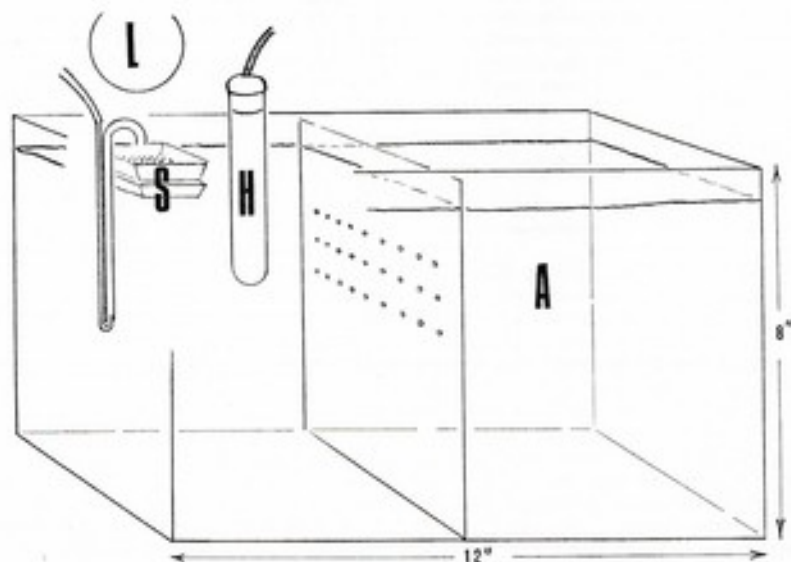
Thus three problems had to be solved, involving:

1. Volume.
2. High yield.
3. Separation of eggshells and hatched shrimps.

The first problem is easily met by using a large container. A large aquarium, 24 in. by 12 in. by 12 in. or more, in stainless steel or anodised aluminium, is prohibitively expensive for this use, so the smaller plastic aquarium 12 in. by 8 in. by 8 in. costing about 15s seemed the logical choice. This holds about 3 gallons of solution.

The second problem of yield of shrimps is solved by using marine salt and high temperature coupled with aeration.

The third problem of separation is solved by making use of the fact that shrimps move towards light upon hatching.



A, Hatching compartment; H, heater-thermostat; L, 25 watt lamp; S, sieves receiving flow from air-lift

From these considerations I constructed a set-up as shown in the diagram. It consists of the 12 in. by 8 in. by 8 in. plastic aquarium with a hatching compartment. This is formed by a strip of black Perspex, with holes drilled across the width from half to two-thirds up, fitted across one end of the tank. A further piece of plastic is fitted across the top as a removable lid. The outside of the tank around the hatching compartment was painted black, to keep the compartment dark and encourage migration of the shrimps to the lighted area.

In the lighted end was fitted an air-lift, with two sieves stuck to the side of the tank (a coarse sieve above a

fine one) next to the air-lift. To complete the set-up a combined heater/thermostat was held upright with a holder against the tank side, halfway along the lighted side, and set to 80°F (26°C).

Eggs are placed in the hatching compartment, and the lid is fitted. Upon hatching, the shrimps make their way through the holes into the larger compartment towards the light at the far end, where they stay until required. When they are required for feeding all that is done is to swivel the air-lift so that the output is fed directly into the sieves. The sieves are removed, rinsed under the tap to remove the salt and the shrimps can then be fed to the fish.

To date some of the first shrimps are still alive after 3 months and there are fresh shrimps each day. Whether these new hatchlings are late hatchers, or if the larger shrimps are breeding, I do not know, further experiments are needed.

At first I fed the shrimps on Liquifry no. 1, but found later that this was not needed, owing to the presence of slight marine algae growth.

Two of these outfits, one for small shrimps, the other for larger shrimps, gives me a reasonable supply and the system has proved easy and trouble free. Later when expense isn't the deciding factor, I plan to set up a similar arrangement in a 36 in. tank.

Getting the Best from Your Air Pump

WITH efficient filtration becoming an increasingly important factor in the hobby, more and more aquarists are investing in air-pumps powerful enough to meet their growing requirements. But, after a few months, often they are disappointed to discover that the pump does not seem to be doing as well as when new; diffuser stones are cleaned and air-lines checked, but all to no avail—and the disgruntled hobbyist then spreads a woeful tale about the 'shoddy pump' he was sold.

With a little thought, however, these episodes could be completely avoided. The vibrator-type of air pump has unfortunately acquired the reputation of being completely maintenance-free, with the result that the purchaser simply plugs it in and then promptly forgets it. All the time it is running, air polluted by grease, dust and smoke would be drawn into the working parts if it were not for the pump's filter-pad. In time, however, the filter itself becomes so clogged that the air finds an easier way of entry (via a loosely fitting baseplate or around the hole used for the electric flex) and, being unfiltered, soon deposits a layer of dust and dirt

on the valve seats: with the combination of the generous output of most of today's pumps with the high level of atmospheric pollution, this is by no means a lengthy process.

To avoid this trouble, the air-filters should be regularly cleaned or replaced—every 3 months is certainly not too frequent an interval. If the filter is made of compressed felt, a washing in liquid detergent, followed by a thorough rinse in clean

By CLIFF HARRISON

water, is the best method; the filter-pad can then be gently stretched to size before drying, and on the next occasion should be replaced with a new pad, costing usually just a few coppers each. Where the filter is a wad of nylon-floss, this should be renewed each time.

One further tip to avoid trouble: many pumps employing a flexible rubber base are equipped with a ring at one end enabling it to be hung on a wall. In time, the weight of the unit distorts this base, creates a gap, and enables air to by-pass the filter

entirely; in addition to this, there is also released a lot of the noise that is usually absorbed by the body of the pump.

If your pump has been neglected and dirt has accumulated on the valve seats, the procedure to rectify the trouble is normally quite straightforward, though care should be taken in noting the layout to facilitate re-assembly. The vibrator arm should be removed first, and the valve block can then be released by undoing the centre screw: if the block is then examined, it will be found to contain two flat, rubber valves. These are usually affixed on one side only and, by carefully raising the opposite side, the valve seat, together with any accumulated dust, will be exposed. For those who own Rena pumps, in these the valves are secured by small rubber lugs, and so may be removed completely from the block. The solidified deposits should be gently removed with a pointed matchstick (never a metal object, as this could damage the seat) and the airways are blown through to remove all traces of dust. The pump can then be re-assembled and put back into service again.

Breeding Fancy Goldfish in the Aquarium

By RUDOLPH ZUKAL

Translation by F. MARSH

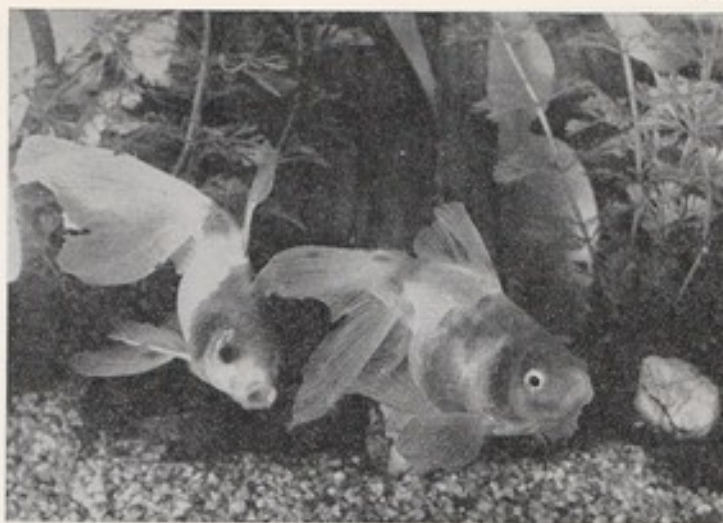
An aquarium breeding sequence
in pictures, of a pair of fancy
goldfish.

Photographs by the author

Below: earliest signs of interest in the female (left) by
the male, who begins to chase her

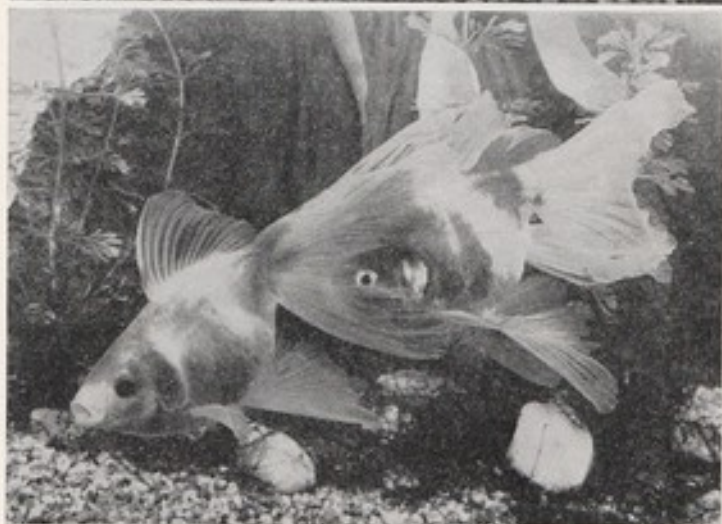


The pair of fish used were selected from a batch of 2-year-old specimens because they had been seen to exhibit chasing behaviour. Such behaviour is the best guide to the sex of the fish although this male (left fish, top picture) showed the pearly tubercles on his gill covers that often characterise mature male goldfish



They were moved to a 36 inch aquarium containing coarse gravel, small smooth stones and strongly growing plants. Plentiful aeration was provided and the water was filtered; some of the water was removed and renewed weekly

The fish had been kept at an average temperature of 65°F (16-17°C), and spawning behaviour was increased by their transfer to water that was about 5°F (2°C) higher



At first the female fish tried to escape from the male but soon she appeared to be content to remain in the vicinity of some moss that formed a small mat on the tank base

The male became greatly excited and continually nudged the female, even butting her from the rear as she stationed herself over the plants





After the female goldfish had selected the spawning site the pair adopted a side by side position and turned heads downwards over the plant mat to commence spawning



Eggs continued to be scattered as the fish moved over the plants with their bodies kept close together



Each egg is separate from the other eggs and they are just visible as nearly transparent pin-head blobs that settle on and adhere to the plants and gravel

As the eggs are eaten by the parents once the excitement of spawning is over, the pair must be removed from the aquarium, or the plants bearing the eggs should be moved to another tank for them to hatch, as soon as egg-laying is finished

The body movements of the spawning pair become quite clumsy as the end of egg-laying approaches and the fish separate. Up to 3000 eggs may have been laid at this stage. It is inadvisable to have sharp-edged rocks in the breeding tank as there is a risk of the fish damaging themselves on these whilst swimming with the after-spawning 'daze'



In the pictures on this page the parting of the pair after spawning is shown and as seen in the lowest picture the female may lie on her side in the plants for a while before raising herself and swimming away



The spawning procedure was completed in the course of about 3 hours



As PFM closed for press we learn with regret of the death of Dr William T. Innes, celebrated American aquarist who was the founder and publisher-editor of *THE AQUARIUM* in 1932 and author of several well-known books on aquaria. Dr Innes was 95 years old in February of this year.

Round the Bulletins

A review of some of the world's aquarium
society publications

By P. F. CAPON

IN AQUA NEWS (Minnesota A.S.) George Maier of the American Killifish Association has written on *Aphyosemion nigerianum*. He states that this fish, first imported into the U.S. from Africa in the late fifties, was originally sold under the name of *A. calliurum* (Ahl). After extensive studies Stan Clausen found that these fish were a new species and were accordingly named *A. nigerianum* after their country of origin.

In the same issue of AQUA NEWS Paul Lofgren writes about his 'Oscar' under the title of 'Mr Personality Plus'. Apparently this fish, which is a real pet fish, can dispose of 11 crappie minnows in 5 minutes and dotes on lumps of freeze-dried liver. He will rise to take the liver from the fingers and if Paul is too slow will stick his head out of the water to meet him. To attract attention this Oscar will bang his head on the back of the aquarium cover. He also delights in grabbing the air-lines and shaking them like a dog with a slipper.

FLARE, subtitled THE BETTA FANCIERS NEWS, is the official publication of the International Betta Congress, devoted to that most beautiful fish the Siamese fighting fish. In issue number one of volume two we learn that one member of I.B.C., Gene Lucas, has recently been awarded a Ph.D. for a thesis on *Betta* genetics at Drake University, Des Moines, Iowa. Gene has his own column in FLARE and promises to tell of his findings on fighting fish genetics in future issues. He mentions the belief that female black fighters are sterile but states that more work must be carried out to prove whether this is really so. Gene also tells of a blue fighter at a recent I.B.C. show that had blue pelvics. This fish won in its class; it appears to be the first record of such a fish as usually blue fighters have red pelvic fins.

THE COLORADO AQUARIST carries an article 'Other Societies and What

they Mean to Us' by co-editor Ella Pittman. Ella is all for societies exchanging their publications since the exchange of ideas and facts can only widen aquarists' knowledge.

In the same magazine, 'Our Gang—the Brackish Boys' by Margaret S. Weber makes very interesting reading. Margaret has successfully kept a number of fishes in brackish water (25% sea water). Amongst others she has kept, *Scatophagus* species, *Toxotes jaculator* (archer fish), *Tetraodon fluviatilis*, *Metynnus* species, lyretail mollies, *Chanda lala* and *Anableps* species. Freshwater scavengers rapidly die of shock in brackish water. Snails can be adapted (if the puffers don't eat them first!).

If fishes are purchased in fresh water it is suggested that they be placed in a 2 gallon battery jar in their original water and then a cupful of brackish water is added every 5 minutes until the jar is filled. This process takes several hours, after which water temperatures are equalised and the fishes introduced into the brackish tank.

The colours of Simpson swordtails and guppies in the part salt water are said to be almost 'electric'. Margaret advises that five scats are a peaceful community whereas two are a grievance committee tending to harass other tankmates and chew their fins.

The main tips advanced for a brackish water tank are to use a large tank (about 20 gallons), to replace about 20% of the water every month, to top up with tap water, not brackish water, not to overfeed (all the usual foods are acceptable), and to maintain the tank in the same manner as a freshwater tank. Of course, the metal of the tank frame should be well sealed and no metal should be put into the water. Coral is not recommended as the inhabitants are fast reckless swimmers and easily startled. Only one plant grows apparently; this is the water sprite, which pro-

duces extremely fine lush growth.

ANCHOR (San Francisco A.S.) recently had an illustration on the cover of ocellated featherbacks (*Notopterus*) drawn by Kappy Sprenger. It seems as if every other society magazine in the States carries Kappy's excellent drawings.

The story behind the cover illustration is an article by Braz Walker (who also writes for PFM) on the ocellated featherback. Braz suggests that this fish is about to displace the discus from its position as 'King of Aquarium Fishes', just as the discus once displaced the angel. Braz covers breeding, which he suggests is unlikely to succeed in the aquarium since the male guards the eggs and fry with such enthusiasm that it will attack human intruders. The female featherback can lay up to 10,000 eggs at one spawning. The fish are not suitable for the community tank; in the wild they eat other fishes, including the famous archer fish. A big tank is a must for this fish.

In his regular column 'Do You Know?' in CALQUARIUM (Calgary Canada A.S.) Larry Hume, the assistant editor, demolishes the old belief that snails remove waste and impurities. He states that snails remove nothing but simply transform the waste into their own excrement. Snails produce excrement faster than plants absorb it and in consequence the tank is rapidly fouled and soon smells.

Larry had some pond snails find their way into three different tanks (70, 30 and 5 gallons). The tanks became infested with the snails and various fishes died off for no apparent reason. The aquaria smelled and it was impossible to keep them clean.

After seeking advice from a friend who is an aquarium curator, Larry introduced a terrapin, which reduced the snail colonies to nil. As soon as the snails were exterminated the fishes stopped dying and the water remained sweet.



TORBAY A.S. has recently held both its A.G.M. and its first annual dinner, and both were equally well attended by 50 to 60 people. At the A.G.M., the chairman commented on the tremendous increase in the Society's membership during the previous 12 months. The show secretary praised the response shown by members in the club's first year of table shows. The secretary, Mr J. Haynes, explained that he was standing down from office because he believed strongly that the success of a club depended on a continuing flow of new ideas and that these were best obtained by regular transfusions of new 'blood'. The chairman, Mr G. Thompson, was re-elected to office. The new secretary is Mr L. Doubleday, 69a Newton Road, Torquay.

Mr L. Doubleday was also the M.C. at the very successful annual dinner, held in Paignton and served by candlelight. Club member Mr E. Perkes, being not only an aquarist but also an associate member of the inner Magic Circle, provided half-an-hour's magic for the cabaret.

THE MANCHESTER SECTION of the **FANCY GUPPY ASSOCIATION** held their A.G.M. in February. Mr Fred Campbell was elected secretary (37 Cardigan Drive, Bury Lanes.), replacing Mr Roy Beresford who had found it necessary to resign because of business pressures. However, Mr Beresford accepted the position of assistant secretary to help Mr Campbell should the need arise. To show their appreciation for his hard work and the manner in which he had served the Association as a whole members of the Section presented Mr Beresford with an electric clock. Mr Ian Grindly and Mr John Hesketh were elected show and assistant show secretary.

The film show that was to follow was a victim of the postal dispute and the films were still reposing at the G.P.O. so Mr Jim Kelly 'stood in' with a talk on aquatic research. Over 100 guppies were benched at the table show and Mr P. Duffy took best in show with a beautiful red delta, winning for himself a gold medal.

Section meetings are held on the first Sunday in the month in the Drill Hall, 3 Stretford Road, Manchester. The entrance is in upper

Cambridge Street where there are excellent parking facilities. Anyone interested in breeding and showing guppies will always be welcome. Says P.R.O. Mr Vic Partington: 'If you have any guppies, bring them along for the show bench. Who knows, you may have a winner.'

A 'TALK-IN' by the chief chemist of their local water board, Mrs Bloxham, entitled 'Local water supply and our aquarium fish' made a very interesting programme for members of **WOLVERHAMPTON & D. A.S.** The lecture was illustrated with slides and projection microscope. Lectures on microscopy and aquarium plants have also been much enjoyed. If prospective new members would like to join in these activities (a slide show on cichlids is planned for 15th April and a lecture on

MR BRUCE INMAN, in the monthly bulletin of NOTTINGHAM & D. A.S., reporting on a breeders' section meeting of the Society, gives the following recipe for his 'wonder' tablets for cryptocorynes or other semi-aquatic plants. 'Obtain 3 lb. of red clay (building-brick-making variety) well mixed with 4 oz. of bone-meal or flour, 1 tablespoon of dried blood, 1 tablespoon of superphosphate of lime and, if you have any hydra trouble, 1 teaspoon of ammonium sulphate. Mix well and knead to patty density, roll out to 1/2 in. thickness and cut into 1/2 in. cubes; put these on a flat metal sheet in a very slow oven to get really dry and very hard and store in an airtight container. . . . Place one of these 6 in. from a cryptocoryne, beneath the gravel, and in a few weeks the entire root system of the plant will be in the clay tablet.'

guppies for 6th May), as well as trips to places of aquatic interest that are being planned, they are very welcome to attend meetings on the first and third Tuesday of the month at the club room over 8 Worcester Street, Wolverhampton at 8 p.m.

Club officials elected at the recent A.G.M. are: chairman, Mr R. C. Short; vice-chairman, Mr E. Wallwork; secretary, Mr W. R. Bateson (71 Orton Lane, Wombourne, Staffs.; Wombourne 3612); Minute secretary, Mr R. Crutchley; show secretary, Mr F. Palmer; treasurer, Mr R. Hill; committee: Mr C. Barsby, Mr F. Bolton, Mr J. Denson, Mr J. Gandy, Mr D. Jacques.

SEVENTEEN new members joined **MERSEYSIDE A.S.** in January of this year and attendances of 50 or more regularly occur at club

meetings. Results of the Society's first table show were:

Mollies: 1, Mr J. Doherty; 2, Mr E. Murgatroyd; Mr K. Parkes. Platys: 1, 2 and 3, Mr N. Petersen. Swordtails: 1, Mr W. Kelly; 2, Mr B. McDermott; 3, Mr D. Broadbent. Barb: 1 and 3, Mr N. Petersen; 2, Mr J. Tasker. Characins: 1, Mr K. Parkes; 2, Mr N. Petersen; 3, Mr D. Broadbent. Cichlids: 1, Mr B. McDermott; 2, Mr N. Petersen; 3, Mr F. Mulla. Anabantids: 1, Mr J. Tasker; 2, Mr P. Clarke; 3, Mr F. Mulla. Rasboras: 1, Mr K. Parkes; 2, Mr N. Petersen; 3, Mr H. Coggin. Sharks and flying foxes: 1, Mr P. Clarke; 2, Mr N. Petersen; 3, Mr J. Doherty. Loach and catfish: 1 and 3, Mr P. Clarke; 2, Mr F. Mulla. A.O.V.: 1 and 2, Mr C. Shaw; 3, Mr D. Broadbent. Pairs: 1, Mr N. Petersen; 2, Mr and Mrs McKnight; 3, Mr J. Tasker. Junios: 1, Stephen Smith; 2, Norman Kirkby; 3, David Moorcroft. Best fish in show, Mr John Tasker's opaline gourami.

THE YORK & D.A.S. Year Book gives details of a very successful year for the Society. Membership has increased to 106 with 21 corresponding members. The open show was a great success and exchange visits were made to Aireborough, Hull, Wakefield and Swillington societies.

The annual awards were made at the dinner and social held this year. A new trophy was awarded to the York member gaining the most points in the open and inter-society shows and it was presented by the Society in memory of all the sterling work carried out by the late treasurer and editor, Mr Albert Simons. Mrs H. Simons made the first presentation to Mr P. Carey, who had amassed 220 points (2, Mr M. H. Cooper; 3, Mr M. Allison). Mr G. Pygott was awarded the C. E. Daultrey Cup for winning the monthly table show competition (2, Mr M. H. Cooper; 3, Mr P. Carey). Novice class, monthly table shows: 1, Mr A. Hargreaves; 2, Mr P. Maud; 3, Mr P. Waddington. Junior class: 1, Master R. Thiel; 2, Master M. Rhodes; 3, Master P. Carey. The editor had a difficult task in choosing the winning article for the Editor's Cup. In the end it was awarded to Mr E. Leadley for an article on 'Power failure warning system'.

TWENTY-ONE years ago, 10 people who were interested in keeping fish as a hobby met in Southampton and formed the **SOUTHAMPTON & D.A.S.**, and it is noteworthy that one of the original ten, Mr R. V. Fish, is now president. Two others are still actively engaged in the tropical and coldwater fish business, one at Winchester and the other as director of one of this country's leading wholesale importing firms. The reports adopted at the Society's A.G.M. gave details of the year's successes. Members had increasingly participated, to good effect, in open shows and there was a satisfactory

FROM the 6th to 9th August, the IRISH FEDERATION OF AQUARIUM SOCIETIES will be staging the biggest show of tropical and coldwater fishes ever held in Ireland. The show is being sponsored by Inter-Pet Ltd through their Irish distributors, S. W. Hamilton, Dunganannon. Over 1000 fishes and 60 fully furnished tanks will be on display, together with water gardens, trade stands, etc. The venue is the Y.M.C.A. Hall, Wellington Place, Belfast. It is hoped to make this an annual event.

reserve of funds. Members agreed that the Society should continue its affiliation to the F.B.A.S. since it was felt that inter-club co-operation throughout the hobby was the best way to help all those interested in fishkeeping. Officers elected for the coming year were: chairman, Mr H. J. Gilbert; vice-chairman, Mr D. Jones; secretary, Mrs M. Gilbert (16 Yew Road, Bitterne, Southampton, SO2 5AW); show secretary, Mr C. McCann; treasurer, Mrs Vincent; committee, Mrs Grimley, Mr Mansbridge, Mr Russell and Mr Schipper.

AT the February meeting of **BRISTOL A.S.**, held at the usual venue—Bishopston Parish Hall—the main item was a taped lecture on the basics of fishkeeping, which proved to be of particular interest value to newer members, all of them avid for the views and comments of the more experienced enthusiasts present. The discussion that arose provided several exchanges of entertaining and good-natured banter much to the delight of the assembled 33 fans.

At this meeting, the table-show season was wound up with the provision of four classes. In the tropical classes, Mr S. Lloyd took first for characins (2, Mr G. Stone; 3 and 4, Mrs C. Allenson). Mrs Allenson also took first card for a.o.v. livebearers with Mr F. Brown in second and third places. The coldwater classes were not well supported but Mr S. Lloyd showed two fish of high standard and received first and second cards for orandas; Master Peter Phillips took the only card for a.o.v. coldwater with a comet-tailed goldfish.

THE FIRST closed show held by **EALING & D. A.S.** was well supported by the public. Mr H. Towell and Mr D. Ellis judged over 100 entries and gave the best fish in show award to Mr E. Tagg for his grass-cutter catfish. Results were:

Characins: 1, Mr A. Ankin; 2, Mr G. Bergin; 3, Mr J. Irvine. Barbs: 1, Mr J.

Healey; 2 and 3, Mr R. Savage. Livebearers: 1, Mr C. Ankin; 2, Mr D. Church; 3, Mr R. Sellers. Guppies: 1, Mr D. Church; 2, Mr C. Ankin. Cichlids: 1 and 2, Mr E. Tagg; 3, Mr A. Ankin. Labyrinth: 1, Mr P. Heal; 2, Mr R. Barratt; 3, Mr J. Burbridge. Rasboras: 1, Mr R. Savage; 2, Mr R. Sellers. Catfish and loach: 1 and 3, Mr E. Tagg; 2, Mr C. Rainbow. Killifish: 1, Mr R. Sellers. A.o.v.: 1, Mr E. Tagg; 2, Mr R. Sellers. Mr J. Burbridge. Pairs: 1, Mr A. Ankin; 2, Mr R. Mills; 3, Mr R. Sellers. Furnished aquaria: 1, Mrs Burbridge; 2, Mr L. Sandfield; 3, Mr D. Church.

As a word of encouragement to prospective furnished aquaria contestants—Mrs Burbridge's winning entry took only 20 minutes to set up!

Awards were handed to winners at the Society's annual dinner by the Editor of **PETFISH MONTHLY** and on this occasion Mr J. Healey also received the Ankin trophy for the highest points in the year, and Mr R. Savage the home furnished aquaria award.

AT the first meeting of the recently re-formed **BOREHAM WOOD & D. A.S.**, the following committee was formed: chairman, Mr Peter G. Abbott; secretary, Mr Len Kain (59 Furzehill Road, Boreham Wood, Herts.); vice-chairman and treasurer, Mr Bob Coulter; show secretary, Mr R. Woolveridge; press secretary, Mr D. Roach; members, Mr Ted Moriarty, Mr Brian Jones, Mrs M. Abbott.

At the second meeting, a party from **MID-HERTS A.S.** was entertained. Winners of the table show were: Guppies: 1 and 2, Mr P. Abbott; 3, Mr L. Kain. A.o.v. tropical, 1, Mr R. Woolveridge; 2, Mr B. Romney; 3, Mr B. Fitzjohn.

The Society meets on the second and fourth Monday in each month at The Community Centre, Allum Lane, Boreham Wood, Herts., and extends a most hearty welcome to all keepers of tropical and coldwater fishes.

FILM SHOWS, panel evenings and first-class speakers are among some of the events that members of **ENFIELD & D. A.S.** can look forward to in the coming year. The committee who will carry through this programme include: vice-president, Mr C. Watts; chairman, Mr J. Coleman; treasurer, Mr I. Young; secretary, Mr E. G. Whittaker (26 Shirley Road, Enfield, Middlesex); show secretary, Mr B. Senior; P.R.O., Mr J. D. Whittaker. Interested fishkeepers who would like to join in are invited to attend a club meeting held on the third Thursday of the month at 8 p.m. at St Andrews Church Hall, Ealing.

A recent panel evening took the form of a true-or-false quiz. Members were divided into two teams and had to choose the correct

description out of two of fish and plants. At this evening the table show for barbs was won by the cherry barb entered by Mrs Baggot (97 points). The golden barb of Mr J. Coleman was placed second with 96 points and third was the rosy barb entered by Miss C. Collins (85 points).

48 MEMBERS of **BRIGHTON & SOUTHERN A.S.** saw the election at their A.G.M. of the following officers: chairman, Mr J. Pelham; secretary, Mr B. Shelton (45 Coventry Street, Brighton); show secretary, Mr V. Aldis; open-show secretary, Mr R. Browning; committee, Mr A. Dawes, Mr D. Shoulders, Mr D. McFarlane. A replacement has yet to be made for Miss Pam Carr, who has decided to relinquish her position as treasurer after 8 years of excellent service to the Society.

By the second meeting in February the Society were comfortably installed in the new headquarters at the British Legion Club, Marine Parade, Brighton. At this meeting a table show for characins was staged and a fine selection of fishes was judged by Mr J. Stillwell of Portsmouth A.S. Mr Stillwell gave a most interesting talk on keeping and breeding characins including his own pirhana—a fish that has acquired a very unfortunate taste for heater leads.

LLANTWIT MAJOR A.S. members recently enjoyed the benefit of detailed advice given by two of their own expert fellow club members. Mr Richard Wigg explained his methods for breeding and rearing veiltail guppies. Brine shrimps and micro worms were used for the first food for the fry; later, screened *Daphnia* and, after 5-6 weeks, Grindal worms were used as an extra food; brine shrimp, however, would still be used once a day. Fry were sexed at 3 weeks and no guppies were used for breeding before they were 4-5 months old. He also explained that aeration was used continually and a quantity of tank water changed once a fortnight, when the mulm and waste would be siphoned off and fresh tap water added. Mr Wigg found that guppies could stand quite a change in temperature provided that it was a

PLEASE note the change of secretary for the **FEDERATION OF NORTHERN AQUARIUM SOCIETIES**. This is now Mr W. T. Kelly, 31 Siddleley Street, Liverpool, L17 8XU (phone: 051-727 1299).

gradual one between night and day-time. His electrically heated fish house would only maintain the house temperature at 68°F, but this rose to 78°F on a sunny day. The water temperature did not change so much because the heaters were placed beneath the banks of tanks.

The second talk, given by the chairman, Mr Henry Songhurst,

dealt with aquarium plants used for a tropical furnished tank. Mr Songhurst described the way in which many plants propagated and how, for successful growth, some required more light than others.

HAMPSTEAD & D. A.S. have changed their venue to the Central Library, Swiss Cottage, London,

N.W.3, and also their meeting night to alternate Wednesdays. At the A.G.M. the following officers were elected: chairman, Mr K. J. A. Pye; secretary, Mr J. Hiscoke (5 Manston, Agar Grove, London, N.W.1: 485 2572); treasurer, Mr J. Bradford; show secretary, Mr T. Cusack; assistant, Mr E. Harvey (and F.B.A.S. delegate). Speakers this

Hackney King's Hall Show: 700 entries

AN excellent example of teamwork emerged at the first-ever **KING'S HALL SHOW** organised by the Baths and Civic Recreation Department of Hackney Borough Council in association with clubs in Essex, north London and the East London Aquarist and Pondkeepers Association. The Show attracted over 700 individual entries, and 2000 paid admissions were recorded during the time it was open to the public. PFM's reporter was pleased to note that a large proportion of the visitors were newcomers to the hobby, and the furnished aquaria classes were a particular attraction to them. The Show attracted a visitor from the B.B.C.'s Overseas Service and a report was recorded by Mr Monty Modlin for the 'Today' programme. The organisers hope to make this an annual event and the success of the first venture should augur well for the future.

The Mayor of Hackney, Councillor S. Clinton Davis, J.P., accompanied by the Mayoress, presented the following trophies; the Bethnal Green A.S. trophy for the best fish in show (a climbing perch) to Mr Ted Islip; the L. Roberts trophy from Chingford A.S. for the best angel fish to Mr L. Pickering; the



General view of the Show in the King's Hall. Below: presentation by the Mayor of Hackney, Councillor S. Clinton Davis, of best fish in the show award to Mr Ted Islip (left) is watched by B.B.C.'s Monty Modlin (right)

Enfield A.S. trophy for the best cichlid to Mr M. Parmenter; the Tottenham A.S. trophy for the best toothcarp to Mr S. Morgan; the Harlow A.S. trophy for the best characin to Mr R. Kerridge; the Walthamstow A.S. trophy for best coldwater fish to Miss R. Berger and the F.B.A.S. award for the best club furnished aquaria to Walthamstow A.S. This club also won the first prize for the club furnished coldwater aquarium and the club furnished tropical aquarium. Other class winners were:

Individual furnished aquarium: Mr S. Mooney, Danio, rasbora, white cloud; Mr S. Mooney, Goldfish, London shubunkin; Mr V. P. Vosey, Native coldwater; Mr V. P. Vosey, Foreign coldwater; Mr V. P. Vosey, Singletails, comets; Mr R. Ebdon, Twintail with dorsal fin; Mr H. G. Berger, Twintail without dorsal; Miss Berger, Fighter; Mr D. C. M. Durrant, Guppy; Mr L. Goff, Platy; Mr J. Day, Swordtail; Mr J. E. Cobden, Molly; Mr B. E. Mason, Corydoras; Mr T. J. Summers, Catfish or loach; Mr G. Greenhalf, Barb; Mr R. Knock, Sexed tropical pairs; Mr G. Owen, Coldwater breeders; Mr D. Smalley, Livebearer breeders; Mr Gilman, Egglayer breeders; Mr C. Stott.



year have been Mr Brian Baker on Fishes of the Amazon, Mr Bert Senior on fishes he has bred, Mr C. A. T. Brown on killifishes, Mr Harry Towell on general fish-keeping and Mr Roy Biggs on *Corydoras* catfish. Enquiries for membership from anyone in the Camden area are particularly welcome and details may be obtained from the secretary.

HEYWOOD & D.A.S. have decided to re-form their junior section and it is envisaged that this will be run as a separate club by the youngsters themselves, with a little help from the senior members. It has also been decided to hold a second show this year, on 9th November, in conjunction with the two-day event of the local Horticultural Society at the Civic Hall.

Officers elected at the A.G.M. are: chairman, Mr G. Kershaw; vice-chairman, Mr A. E. Gardiner; treasurer, Mrs M. Corms; show secretary, Mr A. Evans; assistant, Mr T. Thexton; general secretary, Mr B. Wolstencroft (1115 Middleton Road West, Chadderton, Lancs.); public relations, Councillor J. J. Davies. Mr G. Kershaw has been awarded the inter-club shield and the Wolstencroft Shield for Achievement. Mrs L. Davies won the Ladies Shield.

BETHNAL GREEN A.S. have been enjoying an interesting programme over the past few months that has included lectures on fish-house maintenance, furnished aquaria, a film show and an inter-club challenge table show. During this period, a great part of members' effort was directed towards the Kings Hall Show and it was the Bethnal Green A.S. Trophy that was presented to the winner of the best fish in show award. It appears that names of members of the Society, and in particular that of Mr T. Newman, should have been associated with the design of the fish-transporting box featured in our Aqua-Tip for January, and we apologise for not doing this.

WHERE the champions come from! Master Peter Phillips of BRISTOL A.S. won a card for his comet-tailed goldfish at a club table show. The fish had been obtained for him by Mr J. Phillips, the Society's assistant secretary, on a visit to Pontypridd on market day. The fish had been purchased at an open stall and was transported back to Bristol in a very small plastic bag suspended from a car's windscreen-wiper knob.

VIEWERS to the northern network Granada T.V. recently saw Mr Jim Kelly defending the tropical fish hobby in a programme called 'Come Outside and Say That'. Christopher Ward of the DAILY MIRROR had stated that all pets smell and make a noise, giving Mr Kelly a fair opportunity to discourse on the attractions of keeping fish. The reporter of this item in the F.G.A. Bulletin claims it as a record on two counts—as the first time an official F.G.A. tie was seen on the television and, since Mr Kelly had only a very limited time available, the shortest Kelly speech ever!

THOSE who attended the twelfth meeting of the BIRMINGHAM SECTION of the FANCY GUPPY ASSOCIATION enjoyed a very full and informative disquisition on the Standards Handbook. Mr Ken Rigby of Liverpool was in the Chair and principal speakers from the floor were Mr Don Curry of London and Mr John Davies of Newport, whose views provided a neutral ground or arena for the section's own three 'gladiators'.

Results of the table show, with 126 entries, were:

Novice (2 entries): judge Mr D. Fairhurst; 1, Mrs K. Heard. Colfetail (10 entries): judge Mr J. B. Davies; 1, 2 and 3, Mr P. W. Jinks. Speartail (2 entries): judge Mr D. Fairhurst; 1, Mr J. Wits, Pintail (3 entries): judge Mr D. Fairhurst; 1, Mr K. Rigby; 2, Mr M. H. Delingpole. Topwood (1 entry): judge Mr P. W. Jinks; 1, Mr D. Fairhurst. Bottomsword (5 entries): judge Mr D. Fairhurst; 1, Mr K. Rigby; 2, Mr M. H. Delingpole. Doublesword (1 entry): judge Mr D. Fairhurst; 1, Mr M. H. Delingpole. Scartail (4 entries): judge Mr M. H. Delingpole; 1 and 2, Mr P. W. Jinks. Original veil (2 entries): judge Mr D. Fairhurst; 1, Mr M. H. Delingpole. Long-dorsal veil (14 entries): judge Mr D. Curry; 1, Mr M. H. Delingpole; 2 (joint), Mr J. Wits. Short-dorsal veil (12 entries): judge Mr D. Curry; 1, 2 (joint), Mr J. Wits. Delta (10 entries): judge Mr M. H. Delingpole; 1 and 2, Mr P. J. Duffy; 3, Mr D. Curry. Fantail (4 entries): judge Mr R. Groves; 1, Mr P. W. Jinks; 2, Mr P. J. Duffy. Male colour class (1 entry): judge Mr D. Fairhurst; 1, Mr P. M. Jinks. Roundtail female (6 entries): judge Mr R. Groves; 1, Mr M. H. Delingpole; 2, Mr P. W. Jinks; 3, Mr S. Croft. Superba (8 entries): judge Mr J. B. Davies; 1, Mr P. W. Jinks; 2, Mr M. H. Delingpole; 3, Mr Davies and Mr Reeves. Metropolitan (2 entries): judge Mr D. Fairhurst; 1, Mr Taggart. Scallop (1 entry): judge Mr M. H. Delingpole; 1, Mr P. J. Duffy. Wedgetail (4 entries): judge Mr R. Groves; 1, Mr S. Croft; 2, Mr J. Wits. Coloured female class (5 entries): judge Mr P. W. Jinks; 1, Mr M. H. Delingpole; 2, Mr J. Wits. Breeders males (10 entries): judge Mr J. B. Davies; 1, Mr P. J. Duffy; 2, Mr Taggart; 3, Mr M. H. Delingpole. Breeders females (8 entries): judge Mr J. B. Davies; 1, Mr P. J. Duffy; 2 and 3, Mr M. H. Delingpole. Breeders matched pairs (7 entries): judge Mr M. H. Delingpole; 1, Mr S. Croft; 2 and 3, Mr P. J. Duffy. Master breeders (1 entry): judge Mr P. W. Jinks; 1, Mr M. H. Delingpole. Experimental males (1 entry): judge Mr P. W. Jinks; 1, Mr M. H. Delingpole. Experimental females (1 entry): judge Mr P. W. Jinks; 1, Mr K.

Rigby. The best fish in show award went to the superb female belonging to Mr P. W. Jinks. The best opposite sex to Mr P. Duffy's delta male and the best breeders award to Mr Malcolm Delingpole's master breeders' team.

THE WINTER activities of **GOSPORT & D.A.S.** have included talks by members of the club on breeding various types of tropical fish, slide/tape lectures, films and a very interesting talk by Mr J. Stillwell on genetics. The competition for the rearing of platys was won by Mr D. Bridgen. Table shows have recently been started. That for the a.v. live-bearer class was won by Master Ovens (2, Mrs Littleproud; 3, Mr Clough) and for a.v. danio, minnow and rasbora by Mr Littleproud (2, Mr Clough; 3, Mr Ellick). The future programme includes a home furnished aquaria competition, table and film shows and talks. If anyone is interested in taking part they are asked to contact secretary Mr Ellick, 5 Ankerwyke, Rowner, Gosport, Hants., for all details.

A HELPFUL hint from the EALING & D. A.S. Newsletter. To divide a tank at short notice—use a piece of Formica or similar laminate, slightly wider than the tank so that it can be sprung into position. If polystyrene ceiling tiles are used (as they can be) the tank must have a heater at each end or else the tile will insulate the two halves of the tank so that one will boil while the other stays cold.

DIFFICULTIES met by exhibitors at last year's open show of **HIGH WYCOMBE A.S.** will not be encountered this year at the new venue of Bovingdon Green Hall, nr Marlow, Bucks. Here the club hopes to meet old and new friends on 6th July. Club meetings are held fortnightly on Thursdays at The Angel, Pauls Row, High Wycombe, and new members with either cold-water or tropical fish interests will find them catered for in the Society's programme for 1965. Officers are: chairman, Mr C. Cleave; vice-chairman, Mr R. Bayntun; treasurer, Mr A. Wilkinson; secretary, Mr R. Thomas (Finnamore Wood Camp, Lane End, nr High Wycombe, Bucks.—Lane End 659); show manager, Mr C. Pike; show secretary, Mrs S. Thomas; publicity officer, Mrs A. Seed; librarian, Mr C. Beavis; equipment officer, Mr R. Thomas; committee, Mrs V. Pike, Mr R. Cox, Mr B. Cooke.

TWENTY-ONE this year! THE GOLDFISH SOCIETY OF GREAT BRITAIN celebrates its coming-of-age this year with a dinner and social to be held on 10th May.

In Brief

... AT HARLOW A.S. A.G.M. the following officers were elected: chairman, Mr G. Larwill; vice-chairman, Mr R. Kerridge; secretary, Mr J. Duncan (113 Little Pynchons, Harlow, Essex); treasurer, Mrs V. Duncan; show secretary, Mr J. Jarvis; P.R.O., Mr B. Salisbury; committee, Mrs J. Salisbury, Mr S. Morgan, Mr E. Sharratt, Mr J. Maystone, Mr A. White, Mr J. Soanes.

... CONDITIONS were arctic, but the 26 members of **TONBRIDGE & D. A.S.** who braved them in February to attend the club meeting were amply rewarded by the showing of two excellent films, on genetics and hard water, from the Unilever Film Library. Table show winners were: platys and swords: 1 and 2, Mr T. D. Amos; 3, Mr R. Taylor. Mollies: 1, Mr J. Bellingham; 2 and 3, Mr I. T. Mathieson.

... NEW committee of **NORTH KENT A.S.** is: chairman, Mr G. Savage; secretary, Mr B. Bloss (11 Lane Avenue, Greenhithe, Kent); assistant secretary/members' spokesman, Mr E. Hull; show secretary, Mr A. Randall; assistant show secretary, Mr J. Parker; treasurer, Mr C. Hunter; social secretary, Mr P. Willis. Retiring committee members, Mrs B. Hunter, Mr T. Flint, Mr B. Harvey and Mr C. Wood were sincerely thanked for their services. The club welcomes new members and the secretary will supply details.

... A NEW **HARROW A.S.** has recently been formed and meet on the second and fourth Tuesday each month. Prospective new members should contact the secretary, Mrs P. G. Young, for details (6 Grove Hill Road, Harrow, Middlesex).

... AT the **HASTINGS & BEXHILL A.S.** table show for cichlids, judged by Mr K. Nutt, Mr P. Martin was awarded first, Mr P. Harbord second and Mr J. Watson third. Mr Nutt, an F.B.A.S. speaker, had given a most interesting talk on cichlids, their spawning habits and the rearing of the fry. Members also enjoyed a tape lecture on foods and feeding.

... AT the **GUILDFORD & D. A.C.** A.G.M. it was decided to hold fortnightly meetings, instead of monthly, for a trial period of 6 months. A steady increase in membership has enabled the officers to arrange a very varied programme for the year. New members are most welcome and should contact the secretary, Mr J. Cole, 16 Weydon Hill Close, Farnham, Surrey.

how? How can aquarium water be made acid?

MOST of the fishes that originally came from jungle regions prefer water on the acid side. Characins, cichlids, labyrinth fishes and the now almost ubiquitous killiefishes, all like these conditions, so it is natural for the fishkeeper to wish to alter his aquarium water to suit their requirements, especially for breeding.

The natural way is to steep some peat moss (obtainable from your aquatic dealer) in tap water, boil up the mixture and when it is cooled pour it through a strainer. The resultant amber or brown liquid is slowly added to the aquarium. Take frequent pH readings to check the results. Old oak leaves soaked in water will also give the same results.

Although some inorganic acids such as sulphuric acid, hydrochloric acid and phosphoric acid can be used remember that very small amounts of these can cause drastic changes in acidity and only the last-named acid is recommended. Never use vinegar.

A favourite acidifying reagent is acid sodium phosphate (sodium dihydrogen phosphate). Do not add acid sodium phosphate directly to the water in the aquarium in its crystalline form; mix it with hot water first to dissolve it and add the solution in small amounts until the required pH change is obtained.

One part of dilute phosphoric acid (B.P.) is mixed with nine parts of distilled water; your chemist will do this for you if you explain what it is for. The resultant mixture is slowly added to the tank until the result is obtained. Never use the distilled water sold at garages for topping up car batteries as this could contain undesirable impurities.

Try to avoid changes greater than 0.2 pH in any period of 24 hours. Above all, if fishes are present during the additions these must be done gradually, and a strict watch kept on the fish and water reaction at all times.

... **BARNSELY TROPICAL FISH SOCIETY** is the new name by which the former Barnsley A.S. is now to be known. The club also has a new meeting place at the Alhambra Hotel, Barnsley, on the second Tuesday of the month. At the February meeting Mr K. Scothorn had prepared a quiz in the form of a crossword; the table show for cichlids was won by Mr and Mrs J. Howard (first and third) with a jewel cichlid and a *P. kribensis*, and the blue acara of Mr C. Claypole was awarded second place.

THE Overseas' Secretary (Europe) of THE FANCY GUPPY ASSOCIATION, Mrs Doris Court, is no mean fishkeeper, judging by the performance she set up in continental shows (see VFM January, 1969). Not content to rest on her laurels, however, Mrs Court and her husband Norman are appealing to F.G.A. members to enter fish in a forthcoming show to be held in Sweden from 5th to 7th April. As far as is known, this is the first International Guppy Show to be held in that country.

... 40 members of **KEIGHLEY A.S.** very much enjoyed the slide show on tropical and coldwater and marine fishes presented by Mr Carr of Bradford & D. A.S. Mr White and Mr Webber judged the table show. Winners were: Fish of the month: 1, Mrs Whitfield; 2, Mr Crossley; 3, Mr Bickle. A.o.v.: 1, Mr Bickle; 2 and 3, Mr Dearnley. Novice a.o.v.: 1 and 2, Mr Crossley; 3, Mr Place. Junior a.v.: 1, Master Bracewell; 2, Master Taylor; 3, Master Jackson.

... FORMER club member Mr John Wheeler gave an entertaining and informative talk to **BRISTOL T.F.C.** on fish shows from the viewpoint of both exhibitor and judge. There were many questions from members eager to ensure that their fish would show to good advantage and a clear picture given of some of the difficulties connected with judging. Prospective members and club secretaries please note that the new address of secretary Mr W. E. Holland is 47 Woodland Road, Nailsea, Bristol BS191HX.

... **STRETFORD & D. A.S.** officers are now: president, Mr W. Hornby;

chairman, Mr R. Wilde; vice-chairman, Mr T. Roocroft; secretary Mr Roger D. Hunt (8 George Street, Urmston, Manchester); treasurer, Mr A. Bebbington; show secretary, Mr J. Jackson; assistant show secretary, Mr A. Stear; club members, Mr E. Whittaker, Mr G. Cannon; show committee members, Mr A. Wilkie, Mr I. Roocroft, Mr B. Hilton. New members are welcome on every second Thursday of the month at 8.15 p.m. at the A.E.I. Club, Moss Road, Stretford.

... 40 members of **BASINGSTOKE A.C.** enjoyed the talk on diseases given by Mr D. V. Jones of Southampton A.C. Mr M. Carter of Bracknell A.C. judged the 35 fishes in the table show. Results were: a.v. labyrinths: 1 and 3, Mr A. Blake; 2, Mr J. Mitchell. A.v. fish: 1, Mr A. Blake; 2, Miss K. Box; 3, Mr F. Lange. A.v. novice: 1, Miss K. Box; 2, Mr H. Gough; 3, Mr K. Winslade.

... AT its recent A.G.M., Mr A. M. Deakin was again elected president of **DERBY REGENT A.S.** Others elected were: chairman, Mr P. Wilby; vice-chairman, Mr R. Ellis; secretary, Mr P. Kendrick (10 Cumberhills Road, Duffield, Derbyshire); assistant secretary, Mr R. Bull; treasurer, Mr T. Jerram; show secretary, Mr E. Hazeldine, assistant show secretary, Mr J. Beards; librarian, Mr H. Whitney. The club's monthly magazine is attracting an ever-growing number of readers.

... **WARRINGTON A.S.** members greatly enjoyed a recent talk by Mr K. Rigby, chairman of the Liverpool Branch of the F.G.A. By means of some colourful drawings, he explained the standards of the various types of guppies accepted by the F.G.A. The fish of the month contest for barbs was won, in the small barb class, by Mr B. Beswick (2, Mr R. Tench; 3 joint, Mr E. Clarke and Master J. Pritchard) and in the large barbs by Mr J. Alcock (2 and 3, Mr L. Crawford).

... **OFFICERS** elected at the first A.G.M. of **SYDENHAM & PENGE A.S.** were: chairman, Mr A. Tucker; secretary, Mr M. Alderson (11 Princes Road, Penge, London, S.E.20); treasurer, Mr L. Pickering; show secretary, Mr P. Ridlington. Meetings are held on alternate Wednesdays at the Crooked Billet Public House, Penge, and new members are most welcome.

... **EDMONTON SECTION** of the **FANCY GUPPY ASSOCIATION** hold their meetings on the first Sunday of the month at 3 River Front, Enfield, Middlesex (opposite the railway station). Visitors are welcomed and Mr Don Phillimore of 103 Wilbury Way, Edmonton, Lon-

don, N.18, will provide information (s.a.e. please). In February there were 81 entries in the table show judged by Mr G. Goodall. Mr B. Holmes won best fish in show with a royal blue short dorsal veil given 79 points. Mr Brian Hawkins gave a most interesting lecture on guppy history and standards.

... **LADY** members of **HORSFORTH A.S.** had no little difficulty in keeping secret their proposed entertainment for Ladies Night but they did manage it. In fact, they had arranged a darts match with two male teams, one junior and one ladies team. The winner of each team played off for the highest score. Mr Barker was the 'Champion of Champions' and won an engraved cup and a large tin of fish food. Each winner received a Society scroll—these were Master Kirkbright, Mr Barker and Mrs Dickinson.

HURRY to get your entry into the 2nd NATIONAL FURNISHED AQUARIUM EXHIBITION, Bradford, 18th to 22nd June inclusive. The sponsors, K.B. Tropical Fish, expect a record entry and are accepting only 100 entries. There is over £200 in cash to be won; entry forms and rules are now available from K.B. Tropical Fish, 568 Great Horton Road, Bradford 7, Yorks. The Exhibition will be open daily from 10.30 a.m. to 9 p.m. and from 10 a.m. to 5 p.m. on Sunday, 22nd June. Parties from aquarist societies will be most welcome and refreshments will be on sale at the Exhibition. The admission fee is 2s. 6d.

... Mr D. MALTON was elected president at **WITHAM & D. A.S.** A.G.M. Chairman, Mr D. Willett; vice-chairman, Mr A. Gall; secretary, Mr M. Claydon (165 Barnard Road, Galleywood, Chelmsford, Essex); treasurer, Mr R. Nobes; committee, Misses M. Brown and D. Brown, Mr Brown, Mr M. Brett, Mr B. Shelly. Meetings are held at The Albert, Witham (opposite Witham Railway Station) on the second Wednesday of the month and new members can be assured of a warm welcome.

... **RESULTS** of the furnished aquaria competition held by **NEW FOREST A.S.** members were: cold-water, 1, Mr A. Williamson; 2, Mr L. Menhennet; 3, Mr D. Harding. Tropical: 1, Mr A. Williamson; 2, Mr J. Jeffreys; 3, Mr D. Hare. At the February meeting Mr Jeffreys lectured on water and water conditions and demonstrated how to test for pH and water hardness. The requirements and tolerance of

favourite fish for different water conditions were also discussed.

... **SWILLINGTON A.S.** invited members of **HALTON** and **SELBY A.S.** to their social evening and Selby won the darts quiz that provided the entertainment. The Society's fourth annual dinner and dance was held at Monk Fryston Hall and there was a good attendance of members and friends. Mr P. D. Flint is now secretary and all correspondence should be sent to him at 19 Carr Manor Drive, Leeds 17.

... A SAD tale from **BEDWORTH A. & P. S.** Their February meeting—'Ride on the Judges Course'—coincided with a blizzard. No judges turned up. Although the attendance was the smallest in the club's history, 14 stalwarts did battle their way through.

... **THE SOUTH LONDON SECTION** of the **FANCY GUPPY ASSOCIATION** has amalgamated with the **WEST LONDON SECTION**. Officers of the **WEST LONDON SECTION** for 1969 are: chairman, Mr J. Thorne; vice-chairman, Mr H. Brock; secretary, Mr T. Hibbert; treasurer, Mrs J. Thorne; show secretary, Mr J. Milne; assistant show secretary, Mrs J. Milne; P.R.O., Mrs G. Brock (20 Barnford Crescent, West End, Woking, Surrey); floor members, Mr M. Levi, Mr J. White; show stewards, Mr F. Chubb, Mr J. Redford. The Section can now take new members and visitors are welcome on the third Sunday of each month at the Community Centre, Clifton Road, Isleworth, Middlesex, at 3 p.m. Tel.: chairman, 399-8635; secretary, 692-1146; P.R.O. Chobham 8761.

... 33 members of **BRADFORD & D. A.S.** found the talk by Mr Greenwood on fish buying very helpful. Newer members in particular appreciated the hints on how to select good fish and members found a great deal to say on the subject in the discussion that followed.

... **THE** new committee of **LEAMINGTON & D. A.S.** is: chairman, Mr F. Underwood; secretary, Mrs C. Beard (26 Westlea Road, Leamington Spa); treasurer, Mr P. N. Thomas; show secretary, Mr K. Russell; assistant show secretary, Mr P. Taggart; editor, Mr F. Underwood; librarian, Mrs J. K. Smith; committee member, Mr M. Smith. Annual awards were presented to: member of the year Mr P. N. Thomas; show trophy, Mrs J. K. Smith; breeders' trophy, Mr P. Taggart; home aquarium, Mr Black; junior trophy, Mr P. Taggart.

... **SIX-WEEK-OLD** leeri gouramis were distributed among **THURROCK A.S.** members as the chosen fish in the fry-rearing competition to be judged in November. The fish were bred and donated by show secretary Mr Derek Durrant and from their size and condition Mr Durrant had clearly spared no effort in feeding, heating and space allowance to rear such quality fish for club members. Intending members are assured of a warm welcome at the Society's headquarters in 'The Scout Hut, Gypsy Lane, Grays; meeting details from Mr E. R. Nicoll, 16 Kingsman Road, Stan-ford-le-Hope, Essex.

... **OFFICERS** for **COVENTRY P. & A.S.** are: president, Mr P. O. Smith; vice-presidents, Mr J. H. Stanton, Mr W. T. Oliver; chairman, Mr T. Sheehy; vice-chairman, Mr B. Bromfield; secretary, Mr C. J. Grant (23 Cecily Road, Coventry); assistant, Mr A. Adams; treasurer, Mr D. Bains; show secretary, Mr E. Leggett. Members enjoyed the slide and tape show at the February meeting showing the events, news and personalities of last year's **MAL** shows. Table show results were: cichlids: 1 and 2, Mr E. Sheehy;

3, Mr T. Grant. Anabantids: 1, Mr C. Bates; 2 and 3, Mr E. Sheehy. Breeders livebearers: 1, Mr E. Sheehy; 2, Mr T. Grant. Best fish in show, Mr C. Bates' climbing perch.

... **UXBRIDGE & D. A.S.** is 21 years old this year and has 84 members. After another excellent year's activities, which included visits to The Aquarium Show in London and to Portsmouth and representation at many open shows, officers elected for the coming year are: chairman, Mr P. Ginger; vice-chairman, Mr H. Moore; secretary, Mr C. Funnell (123 Wood End Green Road, Hayes, Middlesex); assistant and show manager, Mr R. Forder; treasurer, Mr J. Peters; show secretary, Mr N. Lee (46 Airdale Road, Ealing, London, W.5); assistant, Mr B. Funnell; club hostess, Mrs H. Moore.

... **ATTENDANCES** at meetings of **HARLECH A.S.** continue to rise and 80 aquarists were present to hear Mr G. H. Jennings of the I.M.S.S. lecture. The talk was illustrated by over 50 coloured slides and as an additional visual background two films were shown—'Malayan Seashore' and 'Between the Tides'. Meetings are held on the

third Tuesday of the month at Gabalfa Junior School, Colwill Road, Cardiff, at 7.30 p.m. Further details from secretary, Mr M. Parry, 57 Caerau Court Road, Ely, Cardiff.

... **FORMER** member Mr Barry Legge spoke to members of **BOURNEMOUTH A.C.** on 'Building a Garden Pond' and showed slides illustrating the talk. The table show was judged by Mr J. Jeffery who congratulated Mr Diggins on breeding the neon tetras with which he won the owner-bred pairs class. The a.v. swordtails class was won by Mr Foale.

... **TROWBRIDGE & D. A. & P.C.** have elected the following officers: chairman, Mr M. Patrick; secretary, Mrs S. Scudamore (45 Trowbridge Road, Bradford-on-Avon, Wilts.); treasurer, Mr S. Huntley; show secretary, Mr C. Penny; committee, Mr I. Scudamore, Mr M. Butcher, Mr D. Hayter, Mr C. Pearce, Mrs P. Huntley, Mr F. Gibbs was awarded the plaque as the year's winner of the fish-of-the-month competition. Work has already started on this year's open show, which, it is hoped, will even better last year's highly successful result.

Dates for Your Diary

6th April. **NELSON A.S.** Open Show. Nelson Civic Hall, 2.0 p.m. Schedules Mr B. Tate, 12 Priory Close, Bingley, Yorks (Bingley 2963).

12th April. **EAST DULWICH A.S.** first Open Show. St Barnabas Parish Hall, Dulwich Village, London, S.E.21. Schedules from Mr. D. Sutton, 231 Friern Road, London, S.E.22.

16th April. **READING & D. A.S.** Open Show. Brock Barracks, Oxford Road, Reading.

20th April. **GORTON & OPENSHAW A.S.** fifth Open Show (A.M.D. A.S.). East Manchester Boys Club, Moira Street, Off Ashton Old Road, Nr Openshaw, Manchester 11. Show secretaries, Mr and Mrs Hodgkinson, 125 Gorton Road, Reddish, Stockport.

20th April. **SHEFFIELD & D. A.S.** Open Show. Meersbrook Vestry Hall, Meersbrook Park Road, Sheffield 8 Yorks.

26th April. **THURROCK A.S.** Open Show. Gypsy Lane, Grays, Essex. Bencing 11.0 a.m. - 1.30 p.m. Schedules from Mr D. C. M. Durrant, 22 Kingsman Road, Stan-ford-le-Hope, Essex.

16th 27th April. **STOCKTON-ON-TEES A.S.** Open Show. St Peter and Paul's School Hall, Durham Road (A177), near Mill House Hotel. Schedules from 11 Wylam Road, Norton, Stockton-on-Tees.

27th April. **HEYWOOD & D. A.S.** Open Show. Ambulance Hall, Bamford Road, Heywood (2 min. Town Centre). Schedules to be circulated.

27th April. **BIRMINGHAM SECTION F.G.A.** Spring Open Show. Glebe Farm Community Centre, Glebe Farm Road, Sechford, Birmingham.

27th April. **SUNNYBROW A.S.** Open Show. The Festival Hall, Peel Street, Denton, Nr Manchester.

27th April. **BURY & D. A.S.** Open Show. Trinity School, Trinity Street, Bury, Lancs.

1st 3rd May. **SOUTHEND, LEIGH & D. A.S.** Open Show. The Municipal College, Victoria Circus, Southend-on-Sea near Southend (Victoria) station. Further details from Mr R. Passmore, 39 Grafton Road, Canvey Island, Essex.

3rd May. **TROWBRIDGE & D. A. & P.S.** Open Show. Nelson Haden Girls School, Trowbridge. Schedules from Mr C. Penny, 122 Trowbridge Road, Bradford-on-Avon, Wilts.

4th May. **DUKERIES A.S.** first Open Show. The Winifred Forland Technical Grammar School, Sparken Hill Campus. Schedules shortly from Mrs H. Dornie, 59 Sparken Hill, Worksop, Notts.

4th May. **LEIGH A.S.** Open Show (A.M.D.A.S.).

10th May. **UXBRIDGE & D. A.S.** Open Show. Meadow School, Royal Lane, Hillingdon, Middlesex. Schedules from Mr N. Lee, 46 Airdale Road, Ealing, London, W.5.

10th May. **BRIDGEND & D. A.S.** second Open Show. Bridgend Y.M.C.A.

11th May. **WORKSOP A. & Z.S.** Open Show. North Notts College of Further Education, Blyth Road, Worksop.

18th May. **HULL A.S.** second Open Show. Railway Institute, Anlaby Road, Hull. Details from Mr P. M. Shepherson, 11 Beech Grove, Beverley Road, Hull.

18th May. **MERSEYSIDE A.S.** Open Show. Montrose Social Club.

18th May. **RAINWORTH & D. A.S.** Open Show. At Showrooms, E. Taylor & Sons, West End Garage, West Gate Southwell.

18th May. **MIDLAND AQUARISTS LEAGUE** (Coventry Pool and Aquarium Society hosts). Foleshill Community Centre, Foleshill Road, Coventry.

24th May. **TAUNTON & D. A.S.** first Open Show. Priory Secondary Modern School, Cranmer Road, Taunton. Schedules from Mr D. J. Ramsey, 52 Parklands Road, Wellington, Somerset.

24th May. **KINGSTON & D. A.S.** Open Show. St Luke's Social Centre, Elm Road, Kingston, Surrey. Schedules from Mr G. Greenhall, 39 Garth Close, Morden, Surrey.

25th May. **WARRINGTON A.S.** Open Show. Show secretary, Mr J. Higham, 42 Hood Lane, Warrington (phone 36939).

31st May. **CAITFORD A.S.** Open Show. Caitford School, Stainton Road, Caitford, London, S.E.6. Details from Mr K. Owen, 196 Langley Way, West Wickham, Kent.

31st May. **HARLECH A.S.** first Open Show. Gabalfa Junior School, Colwill Road, Cardiff. Show schedules from Mr P. B. Garner, 71A Moorland Road, Cardiff.

1st June. **NUNEATON A.S.** second Open Show (provisional announcement). Details from Mr G. Cox, 36 Manor Court Road Nuneaton.

1st June. **BOURNEMOUTH A.C.** Open Show. Kirson Community Centre, Pelhams Park, Kirson, Bournemouth. Schedules and entry form after 1st April from Mr Jack V. Jeffery, 30 Brammar Avenue, Southbourne, Bournemouth BH6 4JF.

1st June. **BOSTON A.S.** Open Show.

7th June. **YEOVIL & D. A.S.** second Open Show, Grass Royal School Hall. Schedules ready end April from Mr K. Blake, 23 Glenthorpe Avenue, Yeovil.

8th June. **LINCOLN & D. A.S.** Open Show. (F.N.A.S. judges). Schedules from Mr W. Cassidy, 56 Hollywell Road, Cliff Gardens, Brand Road, Lincoln.

8th June. **GLOSSOP A.S.** Open Show. The Adult Education Centre, Talbot Road, Glossop, Derbys. Benchng, 12.0 to 2.0 p.m. Open to public from 2.0 p.m. Schedules later from Mr D. R. Chambers, 89 Old Road, Hyde, Cheshire.

8th June. **LOUGHBOROUGH & D.A.S.** second National Open Show. Loughborough Town Hall. Benchng, 11.0 a.m. to 1.30 p.m. Judging 1.30 to 3.30 p.m. Schedules later from Mr I. Purdy, 61 Poplar Road, Loughborough, Leics.

8th June. **STRETFORD & D.A.S.** Open Show. A.E.I. Club, Moss Road, Stretford. Schedules from Mr J. E. Jackson, 30 Durnford Avenue, Urmston, Manchester.

19th October-2nd November. **THE AQUARIUM SHOW '69** at the Royal Horticultural Society's Old Hall, London, S.W.1.

14th June. **SOUTHAMPTON & D. A.S.** Open Show. St Deny's Church Hall, Southampton. Details from Mr C. McCann, 7 Waterhouse Way, Southampton, SO1 3PA.

14th June. **LLANTWIT MAJOR A.S.** Open Show. Town Hall, Llantwit Major, Glam. Benchng 12.30 p.m. Open to public 3.0 p.m. Schedules from Mr J. Sanders, 26 Sandfield Road, Aberkeinfing, Nr Bridgend, Glam.

15th June. **BRIGHTON & SOUTHERN A.S.** Open Show. Marmion Centre, Marmion Road, Hove. Schedules from Mr R. Browning, 34 Rowan Close, Fortslade, Sussex.

18th-22nd June. **Second NATIONAL FURNISHED AQUARIUM EXHIBITION.** St George's Hall, Bradford.

21st June. **BRACKNELL & D. A.S.** Open Show. The Prierwood Community Centre, Prierwood Court Road, Bracknell. Details from Mr Len Little, 126 Shepherds Lane, Bracknell.

22nd June. **COVENTRY POOL & AQUARIUM SOCIETY** Open Show. Foleshill Community Centre, Foleshill Road, Coventry. Schedules from Mr C. J. Grant, 26 Cecily Road Coventry.

22nd June. **ALFRETON & D. A.S.** Open Show. Alfreton Hall, Alfreton, Derbys. Details from Mr S. Hill, 35 South Street, Riddings, Derbys.

25th-28th June. **BRISTOL T.C.F.** Open Show. Enquiries to Mr E. Newman, 71 Somerdale Avenue, Knowle, Bristol 4.

29th June. **MEDWAY A.S.** third Open Show. St John Fisher School, Chatham, Kent. Show secretary, Mr G. A. Craft, 75 Dargets Road, Walderslade, Chatham, Kent.

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Continued on page 36

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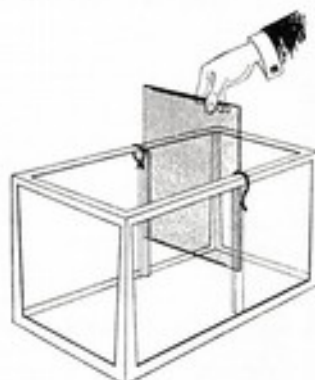
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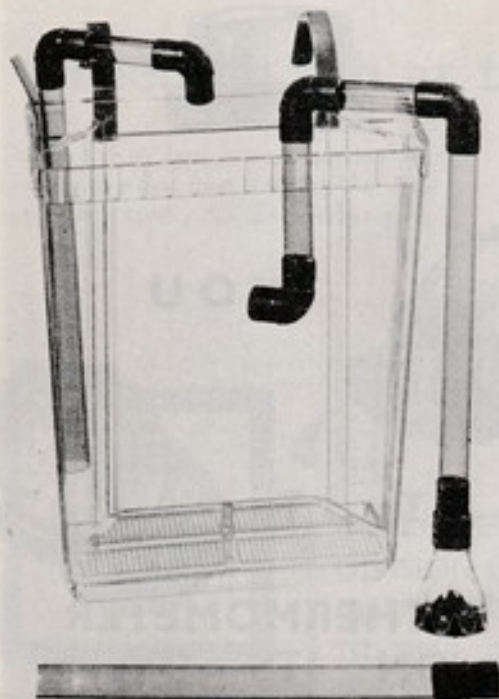
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