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Comments and Quotes

• Fish by rail • 1.9 Million households are fishy • Light-hearted gudgeon

Training Guppies

ARFEE series: In Comments and Quotes last year I drew attention to the terrible risks run by aquarists who might be tempted to take their pets for rides in British Rail trains: paying full fare for a guppy travelling in a compartment indeed seemed possible if the precedent set by that poor mouse was anything to go by. It was with great relief that I now read that mice may travel free, likewise any other creature which can be confined within a box no longer than 18 inches in length. They may not, however, be taken out of the container, nor allowed to annoy other passengers. This must be extremely saddening for breeders of those three-foot card-playing fancy guppies, but I suppose that the majority of us will rejoice that, when it comes to it, B.R. is capable of disposing of manifest stupidities clearly and positively. Other institutions might do well to copy.

Survey of Pet Owners

FOR the first time in this country a survey collecting together information about pet ownership (including fishkeeping) has recently been undertaken. The details accumulated were derived from interviews with housewives and in the report produced by the British Market Research Bureau Ltd the figures have been presented in terms of numbers of households. Thus, in England, Wales and Scotland, there are reported to be 1.9 million households keeping fish (just over half a million of these apparently having only one fish!).

Some facts about the average fishkeeping household also emerge. Its senior members are, for example, most likely to be in the 25-54 age groups and have children between the ages of 5 and 13 in the household (a household with children is four times as likely to be keeping fish as are households without children). Comparisons with the keeping of other pets reveals that households with fish are number 4 on the list, most having dogs (4.7 million households) or birds (3 million households), with cats (2.2 million households) coming in second place.

One thing we can be sure about is that in terms of numbers of animals being kept the fishes are well in the lead (in a single household there can be as many guppies, for example, as there are dogs in the whole town!).

Light-hearted Gudgeon

FROM a caption beneath a DAILY TELEGRAPH picture of a smiling man holding aloft a gudgeon impaled on a hook: "The angler—world champion Robin Harris—netted an MBE in the New Year Honours List. But all he could land when he celebrated with a spot of light-hearted fishing yesterday was this gudgeon, weighting under an ounce. Robin . . . wanted something bigger—to go with that MBE . . . ."

No wonder some people toss them back (decorations, we mean).
Letters

Who will take my Surplus Stock?

In an article some months ago, Mr Peter Unwin talked of the ‘Guppy Bug’ and warned that once one had bred guppies one would either give up or go on to more ambitious projects on guppies. I got this ‘bug’ and during the past year and much experimenting produced a batch of extremely good tilapia. My ambition was a red, white and blue guppy and I finally succeeded. Now, the question is, what do I do with them? I culled a batch of 34 pairs to sell to a local reputable dealer, and, as it was getting near Christmas, thought it would be an idea to dispose of them early. I took great pains to explain to the dealer that all had been quarantined and all were only 4 months old. From the previous batch the females reached over $2 in. in length and the tail fin was close on $1 in. of the superba type.

The dealer offered me $1 per pair, would not listen to the fact that they were young (a sales point to stress) and talked of ‘runts’ and this type of guppy not selling well. Two days later my batch were on sale at 60¢ per pair, with no details given.

Do all guppy breeders have toflush their stock away or feed them to others or demake? I have in my own tank a dozen or so pairs just for show, and they look great. I am most disappointed, not so much about being rooked on price, but over the fact that it seems pointless to continue if the fish cannot be disposed of, in a respectable manner.

I hope you can find space to publish all or part of my letter as I would like to know how other enthusiastic ‘guppyites’ get on. Maybe some ‘get rich quick’ dealer may also reply.

Bermondsey, London, S.E.3

L. W. BEALE

Sensitive Discus

I can sympathise with the discus who had lemonade introduced into their tank (Personal Comment, 1979, January 1979). The shock would probably have the same effect on any self-respecting bitter drinker.

I found it odd that a specific journey was made to collect only ‘a couple’ of lemonade bottles of water (2 pints) to introduce into a large discus tank, which obviously did not allow for partial water changes. That most discus fanciers would recommend. The source of the water was not mentioned but it is unlikely that this was a factor resulting in the death of the discus. The lemonade was the obvious cause and the quick death of all the discus suggests being poisoned.

I have had experience of the distressing effects on discus with only minute quantities of toxic substances which other fishes would not even know were there. My first mistake was soaking parts of a filter in Dettol and even though I washed them carefully before re-using them I very nearly lost all my discus by poisoning. The tank involved had a capacity of 40 gallons.

The second occasion involved the use of a well-known additive for clearing cloudy water. I used a recommended dose but the discus showed distress within half-an-hour and only a considerable water change saved them.

It is perhaps lucky for the discus fancier that they do not appear to be affected by the chlorine in our tap water, and I have changed 90 per cent of the tank water for tap water without any ill-effects.

I no longer introduce any substance to discus tank that is not of aquatic origin, and then only with the utmost care.

Quinton, Birmingham 32

G. F. RILEY

One aspect of the lemonade story reported by Arpee in your January issue might link up with the recent discussions about the hazards to human health formed by the artificial sweeteners called cyclamates. These have certainly been used in some sweet drinks and I wonder whether they caused the death of the discus?

Boston, Lincs.

R. THENG

Design Fault?

Mrs M. J. Watkin’s letter in the December issue of the FPM, regarding spares for the well-known brine shrimp batcher, highlights what appears to be a design fault in this otherwise near-perfect piece of equipment.

Fellow club members have had similar experiences and I have had two strainers disintegrate, the first after only 6 weeks’ use and the second after 6 months. I have been more fortunate than others in obtaining replacements, thanks to the efforts of my local dealer. However, it is becoming increasingly evident that some action by the manufacturers or importers is called for. Perhaps this correspondence will encourage them to rectify the situation.

G. R. PEYCE

Chairman, Hastings & Rothersthorpe a.s.

Letters continued on page 435
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LETTERS

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The dealer offered me 1½ per pair, would not listen to the fact that they were young (a sales point to stress) and talked of ‘rums’ and this type of guppy not selling well. Two days later my batch were on sale at 6/6 per pair, with no details given.

Do all guppy breeders have to flush their stock away or feed them to oscars or dempseys? I have in my own tank a dozen or so pairs just for show, and they look great. I am most disappointed, not so much about being rooked on price, but over the fact that it seems pointless to continue if the fish cannot be disposed of, in a respectable manner.

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G. R. PRYCE

Chairman, Hastings & Rother AS

Letters continued on page 435
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LETTERS

Continued from page 430

Standards for Goldfish

It was with great surprise that we read Mr M. Chase’s letter in December’s PETFISH MONTHLY. He quotes that part of the agreement between the F.B.A.S. and the G.S.G.B. is ‘That in all matters affecting the exhibiting, showing and competing of Goldfishes the G.S.G.B. shall be considered the duly authorised body’.

We would like to point out that this is not so, and is not in the agreement. The full text of this agreement reached in July 1967 was circulated, by us to all affiliated societies, and by the G.S.G.B. to all its members. For those aquarists who were interested but had no contact with either organisation it was published in PETFISH MONTHLY, September 1967, with covering letters by Mr H. O’Neil, chairman of the G.S.G.B., and myself.

A. C. J. N. L.
Chairman, Federation of British Aquatic Societies
Health and Vermiculturists

May we add our small voice against the suggestion that white worms can be lethal or vaguely parasitic to man. We have cultured white worms for 24 years—our yearly production is in excess of 2500 lb.—and we are, and hope to continue to be, disgustedly healthy.

V. J. B. E.
Vermiculturist

New Pipework for the London Zoo Aquarium

Some 1200 ft. of plastic pipe-work has replaced original glass-lined cast iron and galvanised pipes at the London Zoo Aquarium. Air, freshwater and seawater are supplied in the pipes (above—the Durapipe supply route is used for seawater to reserve marine tanks). In the Aquarium’s pump house (left) the piping was easily fitted to metal connections, and this pipe can be joined by ‘solvent welding’. Bay of Biscay seawater is pumped from the 10,000 gallons reservoir to 100 gallon tanks that feed aquariums by gravity. Maximum rate of flow is about 900 gallons per hour in the tropical marine section.
Thoughts on Fish House Construction

By DAVID SMALLEY

Photographs by the author

SOONER or later if you possess a community aquarium the time will come when you will want to try your hand at breeding. For this you will need to purchase additional tanks and equipment, and it is at this stage that wives usually start objecting!

I therefore suggest that you consider the idea of building a fish house where you can shut out the outside world and concentrate on the study, keeping and breeding of fish.

To win over an unsympathetic family, it is a good idea to make the outside of the fish house as attractive as possible. Unfortunately all too frequently fish houses are built from unsightly materials and in a haphazard fashion, although they may be quite satisfactory as regards efficiency.

At one time I used a greenhouse to accommodate my fancy goldfish but found that temperature variations were far too excessive for my requirements. Further, as the greenhouse was of conventional shape, it proved most unsuitable for housing aquaria.

Many aquarists begin in this way with a shed or greenhouse—which has therefore not been specifically designed for the job in hand. This rarely makes for efficient running. I expect most fishkeepers have been in fish houses where it has been difficult even to manoeuvre to see the fish, yet alone carry out routine maintenance!

The lucky ones, who can start work on a brand new building, should first consider the site, if, in fact, the space available allows any room for choice! Factors to be taken into account here are the availability of water supplies and electricity, and the amount of sunlight the location receives.

The actual design (shape etc.) of the building is best left to the individual, but a simple, low building will probably be best. The doorway etc. should be big enough to enable the stands and tanks to be manoeuvred through it.

As most club members will know, the topic of what materials should be used to build a fish house is very controversial. I decided to use bricks, for a really durable building. Bricks are good from the point of view of heat conservation—no doubt you have at some time noted how warm the bricks of a house keep in the cool evening after a sunny day. This asset can be used by the aquarist to avoid excessive temperature fluctuation, as I have proved in my own case. I elected to have reinforced glass for the roof for maximum light combined with durability, and also to have the front of the fish house faced with stone to provide an attractive appearance.

The whole building is pleasing to the eye, and yet completely functional.

On the question of furnishing the inside, aquaria of the usual 12 inch-wide type are often wasteful on service space and I have found the use of 18 inch-wide tanks ideal. In this way it is possible to obtain 50% more surface area for the same viewing or gangway space. Not only...
is the use of 18 inch-wide tanks often the most efficient and economical as regards obtaining the maximum surface area, but the greater the volume of water the longer it will retain the warmth acquired from sunshine. Therefore the lack of fluctuation in temperature is noticeable with these larger capacity tanks.

If you experience difficulty in obtaining aquaria and stands to your own measurements, I suggest you might try contacting some of the advertisers in PFM. Try, if possible, to anticipate your requirements for the future and place as large an order as possible, as this will obviously receive better attention from the supplier!

When working on the fish house interior layout, plan for the larger tanks first; then it is easier to fit in economically any smaller tanks of a more conventional type.

As regards the finish of the frames and stands, I would recommend galvanising for a permanent finish. It is well worth the slight extra outlay. Metal galvanised angle stands are to be preferred to timber: unlike wood, the galvanised metal will not rot, it generally takes up less space, and is, of course, fire-proof.

One of the problems facing the fish house constructor is the choice of roofing materials. Most aquarists seem automatically to choose a glass or fibre glass, for generally fishkeepers are also plant growers and sunlight is thought necessary to produce good plant growth. However, before coming to any speedy decision, consideration should be given to the siting of the building and the range of temperatures required.

It may be that a tropical enthusiast specialising in varieties preferring high temperatures will find heating costs reduced considerably by having a boarded and insulated roof. Plants may be grown by means of tungsten or Gro-Lux lighting. It must be remembered at this stage that the greatest heat loss is through the roof and this is why roofing is so important to an aquarist who could be tacked with high running costs if the wrong choice is made.

In my own particular case of keeping and breeding fancy goldfish, high temperatures are not required in summer or winter and a high heat loss is not important; I therefore decided upon a glass roof.

In the fish house illustrated, the
pinch of the roof has been kept to a minimum to avoid heat being trapped in any high spot. It should be borne in mind that capillary action will take place on overlapping glass and P.V.C. etc., and it is therefore advisable to form the slopes of one section of material only.

From the point of view of heating the fish house, it will be found desirable to keep the building as low as practicable; the aquarium should be arranged within the building so as to utilise space as near to the roof as is comfortably possible.

If bricks are used for fish houses that are for tropical use only, for absolute efficiency it is essential for the walls to be of cavity construction. My own fish house has a cavity wall at the rear, the inner leaf being of Celcon insulating blocks. Owing to confined space, the sides were built of 4½ inch brick, but I should mention that the outside was siliconised to prevent dampness penetrating, and also the inside has been insulated with battens and polystyrene.

As I do not like a lot of bending, I did not have pools incorporated into the floor. Instead, for ease of erection of the fish house, a reinforced 6 inch concrete raft was laid and the walls were built on this—not forgetting to lay a dampproof course.

With ever-rising prices, new building materials can make a fish house rather expensive. New timber especially seems most costly and the quality is often poor. If you have a limited budget I suggest that you visit a local demolition site. Often quite new buildings are being pulled down and the materials salvaged from these are usually very good. The best plan is to have a word with the site foreman and tell him what you are looking for. Always have in mind the new and secondhand prices when discussing your requirements and it should not be difficult to save a considerable amount on construction costs. All timber should be chemically treated before use with an anti-rot and insecticide preservative-type solution, as this will avoid any trouble in the future.

I hope these “thoughts” have interested you, and perhaps sparked off a few bright ideas of your own—only hope your fish house will bring you many enjoyable years of service.

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In Brief . . .

. . . DIDCOT & D. A.S. elected Mr A. Wilkinson chairman of the A.G.M., on the departure of Mr F. Hall, Mr D. C. Whiting (38 Blenheim Close, Didcot, Berks.) is new secretary and show secretary is Mr J. Trinder. The new treasurer is Mr T. Shaw; librarian is Mr P. Lang. Prospective new members and visitors are welcomed at meetings on the first and third Fridays of the month at 8.0 p.m. in the Social Club, Eno Research Centre, Abingdon, Berks.

. . . P.R.O. of the WEST LONDON SECTION of the F.G.A., Mrs Gladys Broek, reports that the great interest shown in the guppies at THE AQUARIUM SHOW 1969 produced a lot of requests for their purchase. It was not possible to grant this, but there is a stock controller in the Association. The Section’s own Autumn Show had 207 entries with visitors from Bournemouth, Radlett and Edmonton sections. The best male fish in the show award (fan) was won by Mr C. W. Parker; best female (colt), Mr W. M. Holmey; best breeders (females), Mr and Mrs Fillmore. Meetings are held every third Sunday in the month at the Community Centre, Clifton Road, Iddesworth at 3.00 p.m. and visitors and new members are welcome.

. . . NORTHWICH & D. A.S. are planning well in advance this year. Their own Open Show is fixed for 28th June and they plan to enter the R.A.F. The committee elected for the year is: chairman, Mr Phil Hyland; vice-chairman, treasurer, Mr Brian Pearson; show chairman, Mr Len Thorne; show secretary, Mr Cyril Davies; secretary, Mr Les Bradbury (4 Ash Road, Sandiway, Northwich); P.R.O., Mr Harry Buckley; table show secretary, Mr Robert Antonio; ladies’ chairman, Mrs Dorrish Thorne; librarian, Mr Mark Pinn.

. . . THE EASTERN COUNTIES SECTION of the FEDERATION OF GUPPY BREEDERS SOCIETIES have changed their meeting to the third Friday of each month, and there has also been a change of secretary. Visitors are very welcome. Any enquiries regarding the activities of this Section should be addressed to the secretary, Mrs L. Myers, at Charlford Road, Canning Town, London, E.16.

. . . RIVERSIDE A.S. very much enjoyed their visit to UXBRIDGE & D. A.S. for the inter-club show. After a good night’s entertainment of slides and a lecture on fish houses, Riverside were the victors by 26 points to 13, with Mr Peter Mains of Riverside taking the best fish in the show award with a velifer medall.

. . . RETIRING members of the THURROCK A.S. committee thanked the club for the support they had received that had made their task so much easier. The new committee is: president, Mr R. Nicholls; chairman, Mr M. Martin; vice-chairman, Mr P. Holckley; secretary, Mr J. Aspinall (38 York Road, Corringham, Essex); treasurer, Mr H. Furze; show secretary, Mr D. Durrant (23 Kingman Road, Stanford-le-Hope, Essex); assistant, Mr John Farber; librarian, Mr R. Flowers; secretary, Mr J. Hinde; publicity officer, Miss A. Sutton; special duties officer, Mr K. Appleyard.

. . . LINE BREEDING of goldfish was the subject of the talk given at the November meeting of the GOLDFISH SOCIETY OF GREAT BRITAIN. This was followed by a discussion of the reprinting of the Standards booklet and by the presentation of the awards by the
Aquatíp

In recent years there has been a gradual evolution of aquarium filters. We now have available filters which use the air from the air pump in a much more efficient manner, and the filters thus do a much more efficient job of keeping both the floor and the water of aquaria clean.

Small tanks can be catered for by some of the less expensive filters, costing between 10s and 20s, but for larger aquariums, it is better to spend 20s to 40s. A good filter can be bought for as little as 21s, and it can be as efficient as those at the other end of the price range.

I have examined a number of outside filters and have found that the dearast is not always the best value for money; in fact I have found that, with a little bit of swapping, one can produce a good filter for a reasonable cost.

In one British-made filter I found that the stream of air bubbles which came from its air stone seemed to be much finer than that from any other type of air stone in use in a filter. I owned an American filter which operated on an air stone, and I wondered if I replaced the American filter’s air stone with a British air stone, would it improve the operation of the filter. I priced the British-made air stone, and it cost 1s, as opposed to 2s 6d for the American filter’s air stone. I obtained a British air stone and fitted it to my American filter. It took a minute or two to do, and improved the filter’s water turnover by, I should say, about 80%. This is quite some improvement for 1s, and the improved filter did not use any more air than before. (Some air stones produce a few big bubbles and these are usually unsuitable for use in a filter as they may give a poor turnover of water.)

One outside filter, made in Denmark, costs 21s. To fit this with the appropriate British air stone would raise its price to 22s. It’s still cheaper than the British model, and has a better siphon and strainer, and an aesthetically more pleasing functional look about it. It’s worth 1s to try a new air stone in your filter!

W. ALEXANDER

BRITISH TRANSPORT provided the 16 mm. colour films that made up 90 minutes of excellent entertainment for members of LLANTWIT MAJOR A.S. Between the ‘Tides’ was of particular interest to the marine enthusiast. Table show results, judged by Mr R. S. Wigg, were: a.v. livebearers: 1 and 3, Helen Jones; 2, Mr Archer. A.V. egglayers: 1, Helen Jones; 2, Mr Ireland; 3, Mr J. Thompson. Helen Jones received a plaque for the best fish in show.

BASINGSTOKE & D. A.S. members were very pleased to learn that they had won the Three Counties Quiz Cup in a very close contest. Recent meetings have included a slide-illustrated talk by Mr A. Forder on aquarium plant propagation, followed by a light-hearted auction of plants donated by the speaker; and a talk by a club member on live foods, which proved very helpful, even if the lecturer would not reveal his own source of Daphnia! Recent table show results have been: a.v. plants: 1, Mr G. Payne; 2 and 3, Mr H. Gough. A.v. novices: 1, Mr T. Sweeney; 2, Mr R. Islesy; 3, Mr D. Putt. A.v. tropical: 1, Mr A. Clarke; 2, Mr T. Sweeney; 3, Mr H. Gough. A.v. labyrinth: 1, 2 and 3, Mr A. Blake. A.v. novices: 1, Mr R. Weston; 2, Mr D. Putt; 3, Mr M. Strange. A.v. tropical: 1, Mr B. Weston; 2, Mr A. Marshall; 3, Mr A. Blake.

SEVERAL MERSEYSIDE A.S. members went home from the talk given by Mr E. Pillingen of Water World Ltd with both prime plants and newly acquired knowledge of how to care for them. The editor of the Mersey Beacon explains that Mr Pillingen not only gave a detailed lecture on various plant specimens but he also donated them to the club for auction. Another most informative lecture was given by Mr B. Pengilly on the anabantid family. Mr Pengilly’s skill as a photographer was well demonstrated in the slides accompanying the lecture.
EDITOR of the BRADFORD & D. A.S. Newsletter has given a detailed look back in the December issue over the club’s year and in doing so describes perhaps a perfect example of the sort of programme that makes a society a thriving organisation. Lectures from club members and from visiting speakers have covered a wide range of aquatic subjects, coldwater, freshwater tropicals and marine, plants, foods, diseases, breeding; visits have been undertaken to places of interest such as Bela Vue Aquarium, Pickering Trout Hatchery and Flamingo Park Zoo; a successful Society Open Show was held, visits to other societies and entertainment of them at inter-society shows including the B.A.F. Fishkeepers who would like to participate in similar activities this year can join meetings—on the first Wednesday of the month in Room 2 and on the third Wednesday in Room 4, at Unity Hall, Rawlin Square, Bradford at 7:45 p.m.

PHIL TAGGART, Graham Maddeman and Robert Woodward entertained members of LEAMINGTTON & D. A.S. with their talk on reptiles—illustrated with live exhibits including lizards, snakes and terrapins. Cross-bred week-old snakes, referred to by the treasurer as ‘cougermen ’Tublex’ were offered for sale by Graham Maddeman. Editor of the Newsletter, Mr F. Underwood, reports on the rest of the proceedings as follows: Phil started the lecture off with lizards; one of them, he was pointing out, could give you a nasty bite—shoving his finger in its mouth. The lizard, of course, promptly shut its mouth and refuses to let go. Graham and Robert in the meanwhile carry on the lecture with Phil popping up from time to time still with the lizard on his finger—a real trooper! The lizard was eventually removed, but not before he had drawn blood. Phil, of course, was worried about infection—not to himself but to the lizard?

MR S. LANGDON used printed photographs from rest to illustrate his talk to YEOVIL D. A.S. members on ‘Fish Extraordinary’, when he described the way in which the adult discus fish form a mosaic on their body on which the fry can feed. The second lecture of the evening was given by Mr Nixon on the preparation, setting-up and maintenance of the marine aquarium. The monthly table show was won by Mrs Forward (2), Mr Phinn and 3, Mr Baker.

NEW secretary of WAKEFIELD & D. A.S. is Mr A. Hudson (57 Hall Fold, High Burton, Huddersfield).

MR A. CLACK (6 Holland Road, Chatham, Kent) has been elected secretary of MEDWAY D. A.S. and Mr J. Marshall (87 Daggetts Road, Walderslade, Chatham, Kent) is show secretary.

NOTTINGHAM & D. A.S. trip to the B.A.F. was very enjoyed and is reported to have been a great success: total income £43 4s 6d; total expenditure £41 4s 6d! Mr W. H. Selby reports in the club magazine that after several pints of best bitter he has volunteered, been persuaded, or asked and accepted the job of ‘Personal’ Officer. It will be his task to bring together club members who have a common interest within the hobby and generally bring people closer together within the Society.

NORTH KENT D. A.S. members have recently enjoyed a lecture on cichlids by Mr Senior and a quiz arranged by club member Mr Tom Flint. Members also gladly accepted an invitation from CATFORD D. A.S. to an inter-club show and look forward to the return match this year. Mr J. Stephenson has been very successful in the table shows winning first and third places in the characin class and second in the breeders’ class. (Characins: Mr E. Hall, Breeders: 1, Mr C. Wood; 2, Mr R. Birch). Prospective new members should contact Mr B. Bliss, 11 Lanes Avenue, Greenhithe, Kent.

THE SECOND stage of the three-cornered competition with BOSTON A.S. and GRANTHAM A.S. was held by LINCOLN & D. A.S. when Grantham were the victors with 286 points against 244 for Lincoln and 152 for Boston. Mr A. Danks judged the show and awarded the best fish in the show award to Mr H. Kume of Lincoln. While judging was in progress an interesting slide show of some of the inmates of the Indiana ponds was shown and ends on the Thursday afternoon at the Lincoln Society.

F.B.A.S. Affiliations

TWENTY new affiliations during 1979 brought the number of societies affiliated to the Federation of British Aquatic Societies to the record total of 209. Societies interested in joining should write to the F.B.A.S. treasurer, Mr R. A. Dove (5 Farm Close, Crawcrook, Berks) for an affiliation form.

Bedfordshire (12%): Bedford, Dunstable, Vauxhall Motors.

Berks (6%): Bracknell, Didcot, Reading.

Buckinghamshire (4%): Amersham, High Wycombe, South Bucks.

Cambridgeshire (1%): Cambridge.

Essex (11%): Billericay, Blackwater, Chelmsford, Clacton, Harlow, Ilford, Leyton, Romford, Southend, Thurrock, Walton-on-the-Naze, Wivenhoe.

Hampshire (5%): Basingstoke, Bournemouth, Gosport, L.W., New Forest, Portsmouth, Southampton, Winchester.

Hertfordshire (3%): Boreham Wood, Hemel Hempstead, Mid-Herts., Stevenage, Verulam.

Kent (3%): Canterbury, Deal, Erith, Maidstone, North Kent, Sittingbourne, Tonbridge.

Leicestershire (3%): Leicester F.K.


Medway, North Kent (5%): Sittingbourne.

Northampton (1%): Northampton.

Oxfordshire (1%): Oxford.

Suffolk (2%): Bury St Edmunds, Sudbury.

Sussex (4%): Croydon, Guildford, Horsham, Brighton.

West Country (8%): Amesbury, Chippenham, Poole, Salisbury, Taunton, Torbay, Trowbridge.

Worthing, Yeovil.

Miscellaneous (1%): Ormskirk, Tewkesbury, Irish Federation, Yeovil.

Handsworth (5%): Edmonton F.G.A., Radlett F.G.A., F.G.B.
Is it Time You Gave Your Electrics Some Thought?

Practical Measures for Electrical Safety and Efficiency

By STEVE FORSTER

WITHOUT the use of electricity, aquarists would find their hobby much more demanding. Try to imagine evolving alternative methods of heating, lighting, filtering and aerating without the use of electricity. The prospect of a fish house maintained at 75-80°F by use of a charcoal-burning, pot-belly stove, tanks aerated by compressed air cylinders or a motorised pump, and illuminated by paraffin lamps would make the mind boggle!

The point, however, is that although electricity simplifies the day-to-day requirements of an aquarium it can also be lethal to both the occupants and the owner of the aquarium. As far as is known very few aquarists, if any, have come to a sudden end from electric shock but many have been found that even a very small leakage current in an aquarium can soon electrocute its inhabitants.

The animal world is much more sensitive to electric shock than humans and this is why devices such as electric cattle fences can be used without danger to human life. The voltage output from a standard torch battery would not be noticed by anyone handling it but could kill or severely shock small fishes such as newts, tetras and guppies.

General Rules for Safety

When electricity is used the installation must be safe and most efficient. The installation which has been wired carefully and neatly. One of the most common causes of earth leakage and short circuit currents is chaffing and fraying of conductor insulation, and it is therefore logical that if the conductors are neatly installed or wound the risk of damage to the insulation is much less than when they are strewn all over the place.

When making adjustments to sealed thermostats, inspecting heater elements and even when changing lamps in a canopy, the supply to these devices must be switched off.

When installing electrical equipment and its circuitry, whether for one tank or twenty, never use cheap, unproven or age-old components.

Cable that has been used previously or stored for a long period of time may have brittle insulation, which can crack or disintegrate if bent or twisted; used lampholders may have sticking contact pins or cracked insulation from overheating.

Equipment and Cable Sizes

Most electrical accessories for the aquarium have a very low current consumption and are therefore cheap to run and also do not require heavy cables for their supply. However, if a number of tanks are supplied allowance will have to be made for the increased current demand. Listed below are accessories, with their current ranges, which are normally found in an aquarium.

- Aerator pump: 1/50 to 1/10 amp
- Heater: 1/20 to 1 amp
- Lamps (filament): 1/10 to 1/4 amp
- Lamps (fluorescent): 1/34 to 1/6 amp

It will be seen that the current demand, depending on the size of tank, can vary from approximately 1/4 amp to 1 amp. However, if ten tanks are in use the current demand will be between 3 and 30 amps. The cable sizes most suitable for use are:

- Circuits up to 1 amp: 7/0076
- 1-3 amps: 7/0076
- 3-6 amps: 14/0076
- 6-13 amps: 14/0076
- 13-18 amps: 23/0076
- 18-24 amps: 34/0076

For cables installed near or above aquarium it is advisable to use either PVC or TPE types, as these remain flexible and are not affected by water or salt vapours.
Aquarium Control Panel

When the correct cables for the installation have been selected the circuit should be given some thought. It is always necessary to have lighting on a separate switch, but for treatment of an infected aquarium for example it is much easier if all accessories are separately controlled. If the supply is brought from the normal domestic electric socket, a small control panel unit can be built, either to stand underneath the tank or incorporated into the framework.

Within this unit all connections can be made in a terminal strip and the protection afforded by the unit ensures that the cable joints are safe against prying juvenile fingers. An

Diagram (a). Lay-out of electric control unit front panel. Heaters (H), lights (L) and filters (F) for three aquaria are controlled by switches H 1-3, L 1-3 and F 1-3 and the aerator for all tanks is controlled by switch A. N1, N2 and N3 are neon indicators, one for each tank heater.

Diagram (b). Schematic wiring diagram for the control unit for three tanks. On the left are the switches (in triplicate, except for A, aerator) for H, heaters, L, lights and F, filters. In the centre strip of connectors the terminals marked • are to be linked. On the right wiring to the three thermostats is indicated by T1, T2 and T3. The mains cable used is 40/0076.

Diagram (c). Wiring arrangement for five raising tanks. All lights are connected to terminals 1 and 2, all thermostats to terminals 4 and 5 and all heaters to terminals 3 and 5 of the five-way strips across the plank. Cable size used is 23/0076.
additional advantage is that all the distribution to the various accessories can be carried out within the confines of the unit, thus eliminating a "christmas tree" type socket with numerous adaptors and plugs growing from it.

If the unit is incorporated into the frame the wiring to the accessories in the tank is unseen, and if the unit is of a free-standing type the cables may be bundled together and run up to the tank behind the legs of the frame.

Diagram (a) shows the front panel and (b) the wiring diagram of such a unit for three tanks. It should be noted that although the main cable for the unit is 40/007/6 the cable to the individual components is either 7/007/6 or 14/007/6.

Where five or more similar tanks such as rearing tanks, are used, a system using a distribution circuit and individual connector blocks can be employed. Diagram (c) shows the typical circuit layout.

An Early Warning System

One disturbing feature of relying on electricity for heating purposes is that, should a fuse blow or a power cut occur in winter during the night, the temperature in the tank or tanks may be dangerously low by the time the failure is noticed. A simple safety circuit may be used that will make such an event immediately noticeable and allow precautions to be taken as soon as possible. The components required are a domestic bell or buzzer, as would be used on your front door, a dry battery of voltage suitable for the bell or buzzer, an optional switch for maintenance purposes, a 220/250 volt A.C. continuously rated change-over relay and odd lengths of cable 14/007/6 size.

The connections of the relay coil should be made in the supply cable to the heater or heaters; should a supply failure occur the relay coil will drop out and the relay contacts will change over from the normally open contact to the normally closed contact, thereby completing the circuit to the bell or buzzer, which will then give an audible warning.

How to Test for Leakage

If some of your aquarium occupants are found dead without any visible signs of battle or disease an electrical leakage fault may be the cause. To determine whether or not such a fault exists a low scale (0-10 milli) A.C. voltmeter should be connected between the aquarium frame and any earthed metal (normally any metal water pipe). If the meter shows any movement, isolate the accessories in turn until the meter drops to zero and you have found the faulty component. If you cannot beg, borrow or steal a voltmeter a standard torch bulb may give some indication if connected as for the voltmeter.

Earthing of individual aquarium accessories is unnecessary and in many cases impossible unless they have been manufactured with an earth connection. If it is decided to earth the aquarium frame make sure that a positive connection is made. The reason for this is that if the frame is incorrectly earthed it is potentially more dangerous than if it were not earthed at all, because someone under the impression that metal is earthed will not worry about touching it as any leakage would go to ground. An earth connection made to a metal stand or frame will not guarantee an earthed aquarium if there is paint on the contact surfaces.
By JIM KELLY

Transatlantic TOPICS

Possibility is that the offspring would have among their numbers individuals capable of survival evolution through need.

The midge larva best known as the glass worm or phantom larva, is no stranger to those hobbyists who have ever collected their own live foods. Though the larval stage of the phantom midge, Chaoborus plumicornis, is a predator feeding on tiny crustaceans, it is in turn a welcome part of most fishes' diet.

Because of its transparency the title 'phantom' is descriptive, in fact if it wasn't for the four pigmented air sacs, two in the thorax and two in the stomach, spotting it would be almost impossible. Now U.S. scientists have found that these kidney-shaped sacs serve a dual purpose: as buoyancy chambers enabling the larva to move up and down in the water under the action of day and night, and as reserve oxygen supplies when grubbing about in the mud searching for food.

By covering a glass full of these creatures with a thin, flexible membrane, and filling it to the top with water, they found that slight pressure on the skin caused the larva to go up and down in the water—rather like those toy divers we played with as kids, that rather magically moved to our command.

Rosario LaCorte is a man of many parts, all of which he does well. Living at Elizabeth, New Jersey, he shares the aquarium hobby with his wife Jane and son Robert, and when Dan Carron, himself no mean fish-keeper visited them, Dan said the LaCorte tanks were brimming over with the widest varieties of spawnings he had ever seen in any hobbyist's hatchery.

As president of the now disbanded New Jersey A.S., Rosario attended every single club meeting for 12 consecutive years—quite a record in itself, which set me thinking whether anyone could top it.

No one would deny the expertise displayed by professional photographer, Andrey Roth, in his many wonderful illustrations of tropical fish. So often many experts are very reluctant to impart to the masses what experience other hobbyists have taught them. This doesn't apply to Mr. Roth!

In a lecture on the subject of fish photography to The Greater City Aquarium Society, New York, he explained many of his professional methods and how they could be easily adopted by the amateur. Here are just a few of the tips he generously passed on:

• While pictures can be taken in a community tank, it is much better to make your own all-glass aquarium for the purpose.
• Avoid white gravel, it gives your picture a washed out look.
• When photographing fish noted for their prowess at jumping, keep them in focus by placing a second glass inside the tank, about 1 inch behind the front glass; this 'cerial' can be tipped forward so the top edge touches the front of the aquarium, thus stopping any fish from leaping out.
• Use an electronic flash or bulb; floodlights overhead is bad.
• Work with no other light on in the room but that illuminating the aquarium.
• If the fish are nervous, work the camera through a screen or cloth drapes.

And finally, the answer to a question I know will be on all our photographic readers' lips: 'What camera does Mr Roth use?'

His favourite is a Nikon with a 50mm lens, but he says the important thing is not necessarily an expensive camera but in knowing how to work within the limits of the one you possess.
A Ready Breeder in Small Tanks

Fundulosoma thierryi (Ahl 1924)

A. R. E. first discovered Fundulosoma thierryi among specimens he received from the Mangua District of northern Togo (between Kadjiersa and Bogode) in the south and Pampamba and Nacaba in the north. This fish is a true annual from the savannah zone, with many temporary small river systems, of northern Togo. In the past, F. thierryi has been often confused with Aplopharynax nudikoi, as one strain of thierryi is very similar to nudikoi even though nudikoi is a species from the humid Ghana forest areas and the eggs differ in many ways. The eggs of thierryi have a thin, non-adhesive filament in one pole, Schedel places F. thierryi between the Aplopharynax and Notoxusinae forms.

The colours vary from strain to strain. This species is a rather deep body, and females are slightly smaller than the males. Males have a green or blue sheen on the head, overlaid with red spots, turning to yellow in the fins, and in some cases orange. The dorsal fin is large, yellow with red or brown spots, the caudal is V-shaped with extensions, again yellow or gold with red or brown spots, the small fin is yellow with red or brown spots, and all fins have a red or brown border. In the female all fins are clear, the body is green to slight yellow with red or brown spots at odd areas, but generally very little colour.

The water conditions required by thierryi are pH 5.5-7.0, DGH 7.5-8.5 degrees. I have bred them in tap water and kept them in that water for some time but softer water will often increase the egg output from the fish. Breeding takes place at the bottom of the tank, which I line with peat or very soft plants (yellow roots will do, or moss anchored to the bottom). The male will force the female to the bottom of the tank, placing his long dorsal fin over her back, and spawn with her just below the surface of the peat. One egg is deposited at a time, so several attempts are made before the female is spawned out. I then separate the male from the female with a glass divider for several days, until the female is once again plump with eggs, and then remove the glass for a few hours until the female is depleted of eggs.

Dry food as well as live food is accepted and eaten with great relish if a pair is spawned often. Eggs are removed from the peat once a week and placed in a little water from the tank for about 10 days; by that time any eggs that are not fertile will have developed fungus and have been removed from the water. The remaining eggs are then placed in a little moist peat and stored in a plastic bag inside a dark coffee jar for not less than 4 months. Then, when I examine them I find that the eggs are ‘eyed up’. I hatch them; if not, I return the eggs to the jar for another month, when I will try again. The fry will hatch if ready, in seconds sometimes, but those that have not hatched in 24 hours will join the others for the next month’s hatch. The fry will feed at once on micro worm and fresh hatched brine shrimp. With good feeding they will be ready for breeding in from 6 weeks or less.

F. thierryi is a very colourful fish and one I would recommend to those aquarists with room for only a small tank; I breed mine in a 12 in. by 8 in. by 8 in. all-glass tank and this does not stop growth if the water is past changed at regular intervals and plenty of good food is used. Any food not eaten in a few hours must be removed as soon as possible in such a small tank.
OBSErvATIONS ON WATER PLANTS IN SOUTH AMERICA

Black Water, White Water and Clear Water

Typical riverside landscape of the Rio Negro region, showing trees and shrubs under water or not into the river with no intermediate zone for growth of water plants.

The heart of the enormous Amazon basin is Manaus, today being transformed into a modern town, but well known as the setting-off point for many expeditions. Many aquarists connect the secrets of the whole of tropical South America with the name of this town. But times have ply numerous riverboats up and down the Amazon (Rio Solimoes) as well as the Rio Negro basin, which empties into the Amazon a little below Manaus, and as far up as Colombia. For hydrobiological purposes and discounting the countless flowing shades and blendings, in the whole Amazon basin three different water types are distinguished, namely black water, white water and clear water.

Black Water

The river system of the Rio Negro represents a typical black water area, of which the lowest pH (most acid) value is evident only in the upper courses of the tributaries. Here pH values from 4 to 4.5 are characteristic, which, as is well known, arise like the black colour of the water from humic acids and other materials of organic origin. In the lower courses of the Rio Negro itself, in August 1945, with a water temperature of 86°F (30°C) we recorded a pH value of 6.0. With Duroxnost no measurable hardness at all could be ascertained; therefore with such low concentrations of dissolved salts this method of water analysis is much too insensitive. The black water in tropical South America is usually considered to be the poorest river water in the world electrolytically; its electrical conductivity frequently reaches the extremely low value of distilled water.

The extremely flat surface area characteristic of the Amazon basin, with the corresponding very small drop in the river bed and with the seasonally sharply fluctuating amount of condensation, has produced a special kind of river landscape for whose exploration we mainly thank Sissi. Because of the considerable tide variations large parts of the low ground bordering the river are regularly flooded. Here is the flood forest, or the laggo rain forest, in which can flourish only those trees and shrubs that can live for months at a time with a large part of their leaves submerged.

By Dr. JOACHIM SCHULZE

Photographs by the author

Translation by F. MARSH
During flood periods the Igapo rain forest is covered to a depth of 18-21 feet above the ground, so that shrubs and small trees, even tree tops, are completely under water. These great variations in the water level can hardly be tolerated by rooted submerged water plants. Added to this is the deleterious effect of the influx of the black water on the plant vegetation, so that in this area we must record an astonishing lack of water plants. We enquired about this of the catchers of tropical fish who were resident in Manaus, and who travelled over the enormous area of the Rio Negro and its neighbouring rivers with their boats. We were given at all times the information that it was hopeless to search for water plants in these areas.

These observations from Nature should be a lesson to many aquarists, who try by peat filtration or the addition of peat extract to the aquarium water to improve the living conditions of aquarium water plants. That which leads in Nature to a barren lack of plants can hardly have good results in the aquarium. However, it should be stressed that this is not true for fish. Very many beautiful varieties of fishes come out of these black waters; for example, the red neon, of which species alone an million fish are exported from Manaus annually. But what holds good for many fishes is often no rule for water plants.

**White Water**

Downstream from this area of the Rio Negro, which is so inhospitable to the lover of water plants, is the white water area of the Amazon. White water is characterised by a relatively higher content of electrolytes in the dissolved solids, a higher pH value (less acid), lying only slightly under the neutral point, and a higher concentration of suspended mineral components which give

Where the open water extends into lighter areas within the flooded forest *Echinodorus* plants are also found. In the water shown here was found a plant that was possibly *Echinodorus tenuis*, Small but could be a new species.
water the loamy opaque colouring. This suspended matter comes from soil erosion in the source areas and the course of the rivers. In course of time, according the conditions of the flow, they are deposited and lead to extensive building up of sediment in the area of area—which is again at times a fully inundated river bed. Here also is found the typical flood or Igapo forest.

Unlike the black water the white water is much more favourable for the development of water plants and so to find considerable aquatic vegetation. Of course, the term must be suited to the enormous variations in the level of the water, so that it is understandable that we find chiefly floating plants or rooted water plants with floating leaves. Characteristic are the immense floating rafts of Paspalum regens and other grasses, which readily adapt themselves to the changes in water level.

Clear Water

Lastly we consider the clear water biotopy, in the area of a small tributary to the south of the Amazon mouth delta near Paixe Boi, east of Belem. Clear water is not capable of surviving. We must remember here that white water, because of the concentration of suspended matter, lets very little light through, so that in a 10 or 20 inch depth of water there remains only a tiny fraction of the light energy from the surface. It is well known that, chiefly owing to the small amount of light penetrating inland waters, rooted and entirely submerged water plants can hardly survive at depths greater than 3-6 feet. The wanderer in summer through our own native waters can persuade himself of this fact.

Another characteristic species of this area is Limnobium, as well as the rare and beautiful Phyllanthus. This belongs to the Euphorbiaceae family, and altogether embraces about 290 genera. Only the genus Phyllanthus, which itself alone takes in 480 species, is a floating water plant.

A characteristic of this area are water lilies, foremost Victoria regia, whose habitat unfortunately we could not reach with the boat; only later were we able to see it by flying over the area between Manaus and Belem at many points. When the water level rises, the plant extends the leaf stalks to a length of 25-30 feet so as to be in a position to adapt itself splendidly to the changing water level.

Our most sought-after Brazilian plants, the Echinodorus species, we did not find in this area at all. Locally collected plant collectors also reported no findings of this plant to us, and it is also unlikely that this plant can exist in such water conditions. If a plant roots at the base, and cannot, either by lengthening its stems or by means of freely floating leaves, take advantage of light from the surface, then during the deep flooding it resembles white water in quality and is produced at times in the lower courses of the white water rivers, where the clouding material has meanwhile been deposited. This area is an old and very well known habitat of plants for aquaria; long before World War 2, smaller Amazon swordplants were collected here and exported to Europe by the first airships, the Zeppelins. The small insignificant river (Rio Paixe Boi) forms a huge flood area.

We travelled over this large lake-like water area with two Brazilian guides, with whom communication was, naturally, difficult. We finally made our questions understood by sign language, when we wanted to reach the habitat of this Echinodorus species. The men understood and merely pointed from the boat into the water. We saw that the water, which was about 25 inches deep, showed a thick bottom growth of Echinodorus amazonicus Ratze, early called Echinodorus brevipedicellatus (Kuntze) Buchenau. The Brazilians climbed out of the boat and in a few minutes had huge clumps of the plant rooted up and packed in the boat.

The plants live here submerged almost the whole year. Only during the driest season, for at the most 4 or
6 weeks, does the water recede far enough for the plants to live emerged. As a result of extensive adaptation to the submerged way of life the plant also propagates itself abundantly through leaf shoots forming on the flower sprays. It is not surprising that this plant is splendidly suited for culture in aquaria.

At certain places the open, fully sunlight water surface extends right into the flooded forest. In spite of the very much inferior light conditions there we found the same plant in large areas in shallow water, which demonstrated to us once more the great adaptability of plants to changing light conditions. Quite near we found in practically the same conditions yet another very beautiful and valuable Echinodorus species with the wide heart-shaped leaves of the species complex 1 (described in my earlier articles in PETISH MONTHLY). According to the descriptions in the literature it could have been either Echinodorus truncatus Small or Echinodorus martianus Griesebach; however, these species have been reported to have a more westerly distribution (Guyana to Costa Rica). It could also be an entirely new variety, as will perhaps be verified as a result of new investigations by Mr. Raja. At all events, here also was displayed a definite adaptation to the submerged way of life, which we could clearly perceive; that is, from the flower sprays of the plants hung numerous leaf sprouts or adventitious plants. Experiments with the cultivation of these plants in the aquarium are now in hand and here the plants have proved themselves well.

In contrast to almost all other representatives of the heart-shaped leaf species complex 1, with exclusively submerged cultivation the plant does not have the tendency either to spoil or to grow over the water surface. As moreover the broad heart-shaped leaf shape is very highly valued for decorative reasons, when set together with the narrow-leaved varieties, one can prophecy a great future for this plant in the aquarium world.

The biotype of the two beautiful Echinodorus species found shows that in the narrower Amazon area the clear water, and not the white water or black water, offers the most favourable living conditions for Echinodorus species.

**Personal Comment**

Continued from page 446

Information. This rather gives the lie to the theory that only weak and run-down fish get 'ich' in the first place. In so many instances, as we have demonstrated above, it is the well-established fish which are vulnerable equally with those that have stood the rigours of importation and transplanted from place to place.

This rather gloomy assessment of the risk of outbreak of 'ich' after the normal quarantine period is not inconsistent with the advice normally given. This is that 14 days should be allowed at least, and this should be extended if the fish are not in superb condition at the conclusion of this period. If one accepts that the vast majority of cysts (like the seeds) will have reacted in the normal 'pre-maturation' period, the odd ones which Nature has put away for a rainy day will be a small minority, and if some form of immunity has built up against attack from them during the ensuing period, they may well have become active but fail to leave a mark on their would-be hosts. It would be interesting to speculate whether fish can actually attract attack by emanating something that is attractive to young 'ich' parasites. Conversely, could they, in good health, exude something that repels them? One thing is fairly certain, and that is that 'ich' is intended to survive, and in this process it will be aided by our very incomplete knowledge of its weaknesses. Aquarists must realise that quarantine with fish is no more likely to eradicate 'ich' attack than will similar treatment prevent rashes from entering this country—the recent headline news which shook the dog and wildlife world underlines the weaknesses of even the most rigorous systems designed for the public good.

The reader may wonder why I have disregarded chemicals as means of eliminating the parasites at the outset. Surely, if we used some of the well-known compounds, even though no spot is evident, we should keep the tank in a more or less sterile state? It is probably true that any free-swimming youngsters would be knocked off, but I am less convinced that the encysted state would succumb in entirety. Most aquarists are familiar with the situation where an attack of spot seems to defy all cures and where the outcome is either death of all the fish or a long-drawn-out struggle with the use of that chemical which has proved most effective. Nature seems quite capable of protecting creatures from man's worse excesses, and poisoning is one of these. Already, the immunity of certain flies to DDT is causing some considerable concern in pest control quarters, and just as some fish seem to have developed an immunity to spot itself, so has spot apparently adjusted itself to certain chemical hazards in various of its strains.

If this Time Delay Theory, as I will tag these idle notions, is anywhere near the truth, what practical measures might one take as a consequence? If I knew the answer to the question as to how the cyst behaves once it is formed I could be firmer with my advice. I believe that the cyst attaches itself to objects, but also that it can drift about unattached without losing its ultimate potency. This would point to very careful transfer of fish from quarantine container to their final destination, avoiding any unnecessary cross-carryage of water in which the cysts might be floating. Gentle netting from the intermediate transfer container into the tank of destination, in other words, rather than 'floating in' would seem to be a wise precaution.

The matter of quarantining plants requires a lot of thought, and I can only suggest that they are put into a container with a rather higher temperature than usual (say 8°C) and with a mild dose of an anti-'ich' preparation. After a week they ought to be safe enough to transfer, provided always that they don't contain any time-delayed cysts which happen to be resistant to the chemical you have used. If you have any suggestions as to a way around this one I shall be very pleased to have them. I think that the only other practical point to bear in mind is the advisability of drawing water from sources least likely to contain cysts. Rainwater from covered bars will almost certainly be sound, as will water from wells and springs. The problem is always to hate to let heavily on this in all parts of the country. Water from anybody else's tank should be regarded as utter poison. The choice is otherwise yours!
Controlled Insemination of Livebearers

It is often desirable to obtain precisely timed initial inseminations of virgin, or re-inseminations of previously impregnated females of the family Poeciliidae. Commonly used methods have been artificial insemination (Clark, 1950) and the introduction of the females to established males for various lengths of time (Rosenthal, 1952).

During studies on the virgin ovarian cycle and sperm replacement in female guppies, Poecilia reticulata (Hamilton), a simple and quick procedure for securing inseminations developed. The technique involves anaesthetising the female in a solution of tricaine methanesulphonate (MS-222) before introducing her to the male previously established in a tank. The concentration of the solution is adjusted to the size of the fish by sprinkling small amounts of MS-222 into the water. The specimen is suspended in the solution until muscular movements cease but opercular spasms are still noticeable. She is then introduced into the mating order of the male usually within a few seconds; insemination takes place shortly thereafter.

If the female revives before copulation anaesthetisation and perhaps a different male may be necessary. Success of copulation can be judged by the type of genital contact and the subsequent jerking behaviour of the male. Contact may be immediate, and the male may approach repeatedly at the genital pore with the gonopodium, pushing the female through the water. Once contact is made, it may last only a fraction of a second, giving the male a slight flip forward; or it may terminate in a sudden snap release as the male carries the female away, causing the pair to spiral in the water. In either case, after the release of sperm from males with a marker gene were successful. Loss of sperm into the water occurred in only 10 (6.5%) of the matings; it was not influenced by the duration of the genital contact. Progeny were produced from eight of these matings; the two failures were from contacts of short duration.

Although females that received a single insemination by this method were not maintained in production until the sperms were depleted, as many as five successive broods were obtained over a period of 110 days.

The advantages of this technique are that it ensures the exact timing of insemination and provides easily observable criteria for determining the success or failure of copulation without resorting to genital sperm smears. Furthermore, the anaesthetised condition of the female permits insemination during phases of the ovarian cycle or gestation period when she normally would be unresponsive (Kadow, 1954; Liley, 1966). This nearly motionless condition neutralises any of her negative-behaviour movements which might otherwise thwart the male in his attempts at copulation. This condition may also simulate a posturing behaviour on her part which may act as a positive stimulus to the courting male (Liley, 1966).

Although this method has been used only for intraspecific matings in P. reticulata, it has potential for investigating the behavioural repertoire in other poeciliid species, as well as for securing interspecific matings where attempts by natural methods prove to be unsuccessful.

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References
The Leeri Gourami

*Trichogaster leeri*

The leeri gourami is a particularly beautiful fish. Although fairly large (reaching up to about 4 in.), they are peace-loving, and indeed somewhat shy; their colouring is lovely. The pearl or mosaic fish, as it is also known, is one of the most beautiful representatives of the labyrinth fishes (Anabantidae), and has graced continental aquaria since the year 1933.

The ecology of its homelands (Indo-China, Thailand, the Malay peninsula, Sumatra and Borneo) includes both fairly turbid yellow-or brown-coloured waters, that allow very little light to penetrate, and the open unshaded waters of the swamps and pools. The rich vegetation along the banks of the turbid streams often forms an arch of plants over the water surface and this, together with the dark colour of the water, creates very unfavourable conditions for a good growth of water plants. On the other hand, the water in the pools, which are lit and warmed by the sun, are well stocked with water and marsh plants. Many of these are the ones we grow in our aquaria.

Among the floating plants the most important one is *Ceratopteris thalictroides* (Indian fern), which is rooted in the bottom but grows over the water surface and *Ceratopteris thalictroides var. cornuta*, which spreads out in enormous patches. Several varieties of *Limnopila* (*Ambulia*), *Hygrophila* and a number of known *Cryptocoryne* species and other plants are represented. In the same area as the leeri live many other species of fishes such as *Barbus*, *Rasbora*, *Danio*,

By RUDOLPH ZUKAL

Photographs by the author

Translation by F. MARSH
When the female (left) is ready to spawn she swims beneath the bubble nest and will push against the male with her head. Immediately the male spreads his fins and curves his dorsal fin and body.

Betta, Lario, Lebuca, Aplocheilus, Botia, Acanthopharyngodon, Dermogenys, Betta, Trichopsis, Trichobitus and Colisa.

Nearly all the anabantids live in shallow water that has been thoroughly warmed through, where the temperature never sinks below 72°F (22°C) and is mostly much nearer 86°F (30°C). Such warm water, containing much mineral material and decaying organic matter, is very poor in oxygen. And so the adaptation found in the labyrinth takes place. They not only take in oxygen through their gills, but, for much of the time, use air from the water surface. The air is sucked in through the mouth and is assimilated into the ‘labyrinth’ organ near the gills. Thus the blood is provided with the necessary oxygen. The used air is expelled through the mouth and gills.

Leeri gouramis should not be kept in too small a tank. Normal tap water that has been left to stand may be used. It should be maintained at a temperature of 72°F (22°C) and planted with bushy plants. Good lighting and not too high a water level provide ideal conditions for the fish. They can be kept in a community tank with small fish, and will thrive on live foods. I have heard many aquarists complain that they cannot rear this fish because it contracts skin ulcers before it reaches adulthood. If, however, leeris are kept in water that is not too old and which is partly changed regularly, they can grow to the imposing size of some 4 in.

The embrace of the mating pair beneath the bubble nest involves inversion of the female (here the turning procedure is only just beginning). Usually the eggs are released whilst the female is on her back below the nest.
Breeding requires no specialised knowledge. Sex differences are easy to see in adult fish. The male is more slender and his dorsal fin is extremely elongated. The female is fuller in the belly, not so intensely coloured and her dorsal fin is rounded. The fish are keen to spawn, but one must be careful to choose a full female for propagation. For the spawning, a medium sized tank can be used, filled with normal tap water that has been allowed to stand and brought to a temperature of 75-80°F (24-26°C). Leafy plants and a few floating plants are then added; stones to serve as a hiding place for the female should not be forgotten since many males become rather vicious and can cause considerable damage to the female.

The fish spawn under the bubble nest prepared by the male. The number of eggs is very large, 1000 being no rarity. After the spawning is finished the female must be removed, otherwise she will be rammed by the male and can suffer injury. The male takes over the job of rearing the brood alone. The eggs hatch after 24 hours and the fry are free-swimming on the third day. At this point they must be provided with the finest live foods and it is also wise to remove the male. The young are ready to mate in their second year.

I have portrayed the whole spawning process in my pictures. It happened in this spawning, a fairly rare though not unknown occurrence, that during...
The eggs are lighter than water and slowly rise after being released. A small cluster of the eggs just released can be seen in this picture, the mating pair again, unusually, being on the tank bottom.

the spawning embrace the fish fell to the bottom and the eggs were produced there. Because the eggs are lighter than water they drifted up to the surface and were collected by the male and taken under the bubble nest. The spawning lasted for some 2-3 hours.

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Readers’ Queries Answered

Power Cuts

Can you please help me in connection with the threatened power cuts? My house is not centrally heated so I am really desperate about the fish. How can I cope with the threatened situation?

In the event of power failure during cold weather the steps to be taken to delay cooling of an aquarium can be listed under two headings:

1. Insulating the aquarium against loss of heat.
2. Supplying heat to the tank, as necessary, from an external (non-electric) source.

(a) The back, ends and base of the aquarium can with advantage be covered with insulating material—expanded polystyrene (e.g. ceiling tiles) in as thick a layer as can be obtained, even before there is risk of power cuts. Then (at night or when a power cut occurs, or when the house is going to be left for several hours and power cuts are likely), all that needs to be done is to cover the tank (top and front) with further insulation—a thick blanket or an eiderdown (make sure that the lighting is switched off) is probably the most readily available. With such coverings the rate of cooling of the tank should be delayed to well within the danger point. Do not remove any coverings to check the temperature for about 4 hours unless power is restored.

(b) In very cold weather in an unheated room a power cut of several hours’ duration could cause dangerous cooling even with the precautions outlined above. Then the placing of a paraffin cored or a paraffin candle at one end of the tank can be effective. The floating of a large saucepan of very hot water in the tank (renewed every 2-3 hours) or even the (cautious) addition of a kettle of boiling water every few hours are ways in which the tank temperature can be kept up.

With provisions of these kinds we think that you will not experience losses of fish from power cuts. The biggest worry would be if you should have to be away from home for a lengthy period during cold weather. Most fishes will survive quite a long period of 65°F and well-insulated tanks (24 in. by 12 in. by 12 in.), starting at 75°F, take quite a time to fall even to this level when unheated at average room temperatures.
Spatterdock

I bought a Cape Fear spatterdock at the beginning of the summer which has grown very well until 6 or 8 weeks ago. Now I can only get the leaves up to about 1½ inches. Can you tell me how to improve the growth of this plant?

It is very possible that your spatterdock has ceased to grow because of a change in lighting conditions. If it was receiving any natural light from a window, the reduction in light-intensity with the winter days would need replacement by extra artificial illumination, as it is a plant that requires strong overhead lighting. The rhizome of this plant, a sprouting portion of which is the form in which it is usually sold, also has a tendency to rot away gradually. This usually happens quite quickly, whereas you have already obtained good growth, but if additional light does not produce the desired result it would be worth gently investigating the root. One plant authority recommends planting the root in a small amount of good soil to prevent this rotting from taking place. Another course of action that might improve the situation is if you do not replace fresh water in your tank very often, would be to siphon out about a third of the tank water and replace it with fresh. Water can become too ‘old’ for good plant growth.

Bumble-bee Catfish

I was offered a couple of bumble-bee catfish but was advised that they need a regular diet of Tubifex worms. Such worms are difficult to obtain in my area. Would it be possible to feed them on dried food instead?

Microplana spathulata will certainly prefer live foods but small garden worms will be equally as suitable as Tubifex. Chopped worm and small pieces of raw ox heart will be acceptable as well. Frozen foods will be taken as well dried food if no other foods are offered. These catfish are peaceful creatures but do have large mouths into which small fish will disappear. They are, of course, nocturnal animals and must be supplied with lots of hiding places of wood or stone or plants to enable them to take cover from the light.

Bulbs as Heaters

I have two 3½ in. by 15 in. by 12 in. tanks each heated by two 40 watt bulbs. These cause the temperatures to soon rise to 80°F after about 7 hours of use. Is there a way to prevent this?

The only satisfactory way of dealing with this problem will be to install an aquarium thermostat. This can be an inside-fitting or an external model and, if wired in series with the heating lamps, will switch them off when the temperature exceeds the value you select.

Adequate Lighting

A short while ago I purchased a lighting kit, consisting of two 40 watt tubes and two chokes, for my 24 in. by 12 in. by 15 in. tank. At the moment I am having difficulty in getting my plants to grow properly. I would be very pleased if you could possibly tell me how many hours I should have the lights switched on and at what time they should be switched on and off.

It is not possible to suggest precise periods of lighting to guarantee plant growth since the individual circumstances vary so much from tank to tank. Nearly always various periods have to be tried to discover the best. If your tank receives no other source of light it would be likely that around 10 hours daily would be the time required for the lights to be on to give best plant growth. It is unlikely that less than 6 hours will be found at all adequate. These suggestions are based on the assumption that you have a mixed collection of plants of the usual aquarium types in the tank.

Polluted Tank

Can you please give me some information on the breeding conditions necessary to breed Apistogramma callopistus or a butterfly cichlid? I have just lost all my American flag fish fry and I am planning to get a pair of ramirezi. Are they suitable in a community tank with other species?

The commercial breeder removes the eggs of the ramirezi from the breeding adult pair soon after mating and raises them in a similar manner to the eggs of angel fish, but it is quite safe to leave the parents with them if you wish; however, though most parents take care of the eggs, just the odd ones find they make a tasty dish, so they must be watched. The adults should be conditioned on live Tubifex, small pieces of meat and live Daphnia, all of which they like. They grow to a size of about 3½ in. As to their suitability for the community tank, some of these dwarf cichlids are and some are not. It is a matter of watching their antics for a few days and not trusting them with small fishes. Remember, even the zebra can become hostile and it is improper to ‘type cast’ every single member of a fish species as being either peaceful or warlike.
The Riddle of the **Pristella riddlei**

By J. Lee

Sometimes, the X-ray fish appears to be merely plain and unattractive; to others it is warm and exciting. It is a common enough fish to purchase as a rule, though if you want it suddenly you may well find that it's going through one of its periodic disappearances. If suddenly, it will be about again in the aquatic shops.

I find it an attractive fish and fishkeepers who do find it pleasing have here a handy, long-lived, peaceful but active inmate for any community tank of medium-sized fish. It is described by several common names—in a lot of places it is referred to as the 'enamelled fin', but where I live it is known as the 'X-ray' fish' because of its partly transparent body in which the swim bladder can be easily detected.

It is not difficult to describe the coloration in this species, and there is really not much difference in this respect between the sexes. The transparent body has a touch of green in the upper region near the back. The dorsal fin is short and round, tipped with white with patches of black and yellow below, and held erect. The anal fin is transparent, tinted pink on occasions with the bottom edge merging into black and yellow. The eye is black with a faint iris. Caudal and ventral fins are tinted slightly pink. The females are usually larger and fuller, dipping deeper at the back from the anal fin, and when breeding are paler in colour. The male is more streamlined, with deeper colour in his dorsal and more curve to the anal. When adult, it reaches a length of 3½ to 2 in.

A good breeding pair need to be 12 to 18 months old to obtain good results. Many people consider this species to be easy to breed, but I disagree entirely with this. I would myself class them as 'hard' and I have found on occasion that they can be a difficult fish to induce to spawn. My best spawnings have come when the adult fish have been well conditioned on live foods for some weeks and then the sexes separated for 3 to 4 weeks before breeding. It breeds in the usual characin way, but requires plenty of light (if possible, sunlight) and, as they are very swift-moving fish, a tank of size 24 in. by 12 in. by 12 in.

Delayed hatchings of up to 10 weeks from spawning are reported with this fish. I have not personally experienced such a delay, but after one spawning which produced 80 fry, the spawning tank was left empty for 3 weeks and 15 more fry suddenly appeared. These were transferred and 4 weeks later a few more were seen, 7 weeks from the original spawning. On this occasion I left the tank for 11 weeks before deciding it was safe to take it down.

Pristella eggs can be obtained and the fry require very fine food, such as egg yolk squeezed through fine muslin, very fine infusorians and newly hatched brine shrimps, on which the fry will gorge themselves until they look ready to burst and the reddish-brown shrimp colour can be clearly seen in their stomachs.

Incidentally, one of the best colour contrasts I ever obtained in my fish house was when I mixed 20 young adult Pristella in a 3 ft. by 15 in. by 12 in. tank with the same numbers of similar sized serpae and roseacaeus, which I had bred at the same time. It was really an impressive display. Another little wrinkle I have learned in connection with X-rays is that if the water is tinted slightly pink, the fish, particularly the males, become very highly coloured. It happened quite by accident when by mistake I dropped a couple of small grains of potassium permanganate into the tank; but for 3 or 4 days, while the water was tinted, the fish looked really vivid. I do not know the explanation for this, unless the dye acts as some sort of stimulant. Unfortunately, of course, the colour does not last long in the water.

The spawning set-up that I found successful was to cover the tank bottom with a good layer (some 2½ in.) of marbles or pebbles, as for bars and danios. The spawning medium used was, in fact, upholstery packing that had been well boiled, of course, spread all over the bottom and clumped up in the middle to about half the water depth, which was some 9 in. of well-matured water topped up with fresh tap water. The temperature at the time of spawning was 78°F (25°C) and the eggs hatched at 81°F (27°C). Spawning was induced by the light of the morning and the early sun hitting the front glass of the tank. The parents should be removed as soon as possible after breeding, as they are egg-eaters, and the top of the tank shaded to prevent too much light affecting the eggs.

This species is native to Venezuela and the Guianas and is sometimes known in America by a suitably descriptive name 'the goldfinch characin'.

In guppy breeding, too many aquarists believe that they should breed with the male guppy as soon as he starts to display his colours. This stems from the misguided idea that this is a sure way to ensure he passes on 'vigour' to his future progeny.

Because the colour patterns change as the fish matures, I have even heard breeders claiming that by mating them when young they ensure that one particular colour combination will be handed on! Do these misguided folk honestly think that the genes carrying the inherent material to influence the male's offspring change with age?

If you do breed with such young fish then you might be unaware of any inherent weakness in the strain, or maybe a deformity that will only become obvious as the fish matures. When a breeder goes on, brood after brood, using such immature fish it is not surprising that much time and effort is wasted, which results in the breeder, when he does eventually allow some of the fish to reach adulthood, throwing out the strain in disgust. He then blames that whipping boy of the hobby, 'inbreeding', as the cause. When are they going to understand that inbreeding only made their mistake of improper selection obvious?

On television, colour has arrived for the masses like some many-tailed guppy—the world was told to expect the sunshine and received anything but natural colour. In Britain the guppy show bench has concentrated on the shape of its fish rather than on their colour.

With 1970 promising the curtain up on 15 male outlines and seven female, the British breeders won't want for variety but, like the serpent in that other Eden, the question has reared its head: 'Is it time for us to consider the sub-division of our more popular classes into colour?'

Though, I agree, some of the broadtail classes in our shows do tend to be a little overweight compared to the shorter varieties, my answer is still a definite 'no', and not without reason or experience.

This colour system has been used elsewhere in the world for some time and has only resulted in a virtual disappearance of many types of guppy. And that isn't all, it has created controversy as to when a blue guppy is no longer blue but black.

By PETER UNWIN

Then take the green group. Most of my readers who have kept these varieties know that green can merely be a matter of light angles. Heaven help our poor judges if we expect them to sort out these kinds of problems as well as what they already have.

Colour television has arrived as a costly 'con'; it could be just as expensive if we applied the same principles to the show bench.

To succeed in this world you must be prepared to change, but change with a reason for so doing and not for its own sake. One change that will soon be affecting all of us will be the introduction of the metric system—will someone crack the 4 centimetre male? (see PFA for October, 1968, page 277).

To test just how prepared fishkeepers are for the take-over we took a cross section of all ages and asked them one question: 'What exactly is a milligram?'

The answers were a riot, though a few surprised us by getting it right. 'It's about the size of a pinhead,' 'Some kind of chart, I think.' 'Has it anything to do with the weather forecast?'

'Must be a million grams, though what a gram is is anyone's guess.' The best answers came from two lady hobbyists: the first thought it was one of those Greetings Telegrams where you had to keep the message to a certain number of words (she thought I said 'mini gram?'); the second said she didn't know, but, if it would help me, the regular prescription she had from the doctor had 100 milligrams printed on the label and the tablets were pink and ever so tiny . . .

Before you, dear reader, start chuckling, and without looking it up, do you know what a milligram is? (Answer is at the foot of this page.)

Automatic feeders for fish tanks have been slow to catch the imagination of the British hobbyist. Perhaps availability and price had something to do with it, a reason why the now so-called 'vacation blocks' have become very popular, I think.

Briefly, these consist of some binding medium having fish food embedded in it; the block slowly dissolves, releasing portions of food at regular intervals during your absence.

If you use these blocks do check that the pH of the water isn't drastically changed by them, because one we tested had just that effect.

In the early days some manufacturers used glitter of Paris and I don't have to go into what those blocks did to the water.

Another point is that these feeding blocks attract the snails and soon become smothered with the creatures eagerly eating the exposed food. But this can be a blessing in disguise. One reader used the blocks to eradicate snails from his tank—he simply took the block out each day, killed the snails adhering there, and replaced his 'trap' for another haul.

Milligram: a thousandth part of a gram. If you didn't know then you need a dictionary—it's crammed with all you need to go metric.
ALTHOUGH EALING & D.A.S. were disappointed in not quite making an award for the society tableaux at the Aquarium Show, they felt the disappointment was more than compensated for by the large number of new members who appeared at the club as a result of the Show. At recent meetings, the accent has been on ‘home-grown’ lectures given by club members, and topics have covered subjects such as feeding, electricity, diseases and things to make (including a very efficient power filter), as well as slide shows prepared by members. With the onset of winter, the social committee have also been getting into their stride, and a ‘Tramps’ Ball and a Fancy Dress Fantomime evening have already been great successes. A children’s party and a dinner and dance are also planned.

The competitive side has not been forgotten and an away match was recently held with Uxbridge A.S. The home team were victorious by 88-4 points to 86-4, but Ealing has promised revenge at the next confrontation.

MID-SUSSEX A.S. were hosts at the annual inter-club show held with Brighton & Southern, Redhill & Reigate, Crawley and Littlehampton societies. Each club entered three exhibits in four classes, and judge Mr Cannon commented on the fine standard reached by many of the 75 entries. The best fish in the show award was won by Mr D. Soper of Mid-Sussex with a Metynnis, in the open class. A total of 963 points resulted in a win to the home team by 939 points. Brighton & Southern were second, while Redhill & Reigate were third. A children’s party was arranged following the Littlehampton third with 915, Redhill & Reigate fourth with 968 and Crawley College fifth with 835 points.

There were 24 entries in the club’s home aquarium competition and results were: 1, Mr J. Walker; 2, Mr A. Prior; 3, Mr D. Soper. In the junior section, first place went to Andrew Dawsaniiski, second to S. C. Dawsaniiski and third to D. أمسون. Results of the club’s Exhibitor of the Year competition have been announced: senior section, Mr D. Soper 641 points, Mr J. Walker 592 and Mr C. West 642; junior section, A. Dawsaniiski 569, S. C. Dawsaniiski 266, D. Ramsdell 194. New members are always welcomed by the Society should they contact the secretary, Mr J. Reeve, 36 Rumbolds Lane, Haywards Heath, Sussex.

HEYWOOD & D.A.S. held their annual show in conjunction with the Heywood Horticultural Society’s show and both Societies felt that they benefited from the arrangement. Visitors to the flower show took a great interest in the fish exhibits and the display aquarium, and club members are sure that a few more prospective ‘addicts’ have been attracted to the fishkeeping hobby as a result. The best fish in the show award was won by Mr. D. Moorcroft of Merseside A.S. for a scat (83 points). Other results were:

- A.V. fancy goldfish: 1st Mr S. Walsh (Accrington, 79); 2nd Mr G. Kench (Heywood, 71); 3rd Mr J. E. Cooper (Huddersfield, 72); 4th Miss E. Davies (Heywood, 71); 5th Mr C. H. Whitton (Accrington, 56); A.V. coldwater: 1st Mr C. H. Whitton (74); 2nd Mrs Cobbe (Belle Vue, 73); 3rd Mr. A. Key (Huddersfield, 64).

- Guppies (male): 1st and 2nd Mr W. Orton (Salford, 77, 75); 3rd Mrs Cobbe (75); Guppies (female): 1st Mr K. T.ョン (Glossop, 72, 73); 2nd and 3rd Mr. M. T. Webb (Salford, 72); 4th Mr W. J. Murray (Salford, 73); Medium bars: 1st Mr M. T. Webb (Salford, 71); 2nd Mr J. Murray (Salford, 73); 3rd Mr C. Britton (Ashton, 72); Large bars: 1st Mr. C. Britton (71); 2nd Mr. M. D. Molton (Valley, 56); Larsons, Characin: 1st Mr F. Gates (Castleford, 70); 2nd Mr. T. Webb (Salford, 72); 3rd Mr. D. Trace (Ashton, 70); 4th Mr. E. M. Peel (Heywood, 73); Master I. Hippestall (Castleford, 70); 2nd Mr A. Kaye (Huddersfield, 72); 3rd Mr. C. H. Whitton (72); 4th Miss E. Davies (Heywood, 71); 5th Mr. A. Key (Huddersfield, 64).

- Small bars: 1st Miss R. Kaye (Huddersfield, 70); 2nd Mr. D. W. Smith (Tadcaster, 70); 3rd Mr. J. Murray (Salford, 73); Medium bars: 1st Mr. M. T. Webb (Salford, 71); 2nd Mr. T. M. Unkerson (Glossop, 71); 3rd Mr. C. Britton (Ashton, 72); Large bars: 1st Mr. C. Britton (71); 2nd Mr. M. D. Molton (Valley, 56); Larsons, Characin: 1st Mr F. Gates (Castleford, 70); 2nd Mr. T. Webb (Salford, 72); 3rd Mr. R. Moorcroft (Merseside, 77); 4th Mrs. J. A. Peel (Ashton, 72); 5th Mr. M. Webb (Salford, 72); 6th Mr. J. G. Peel (Heywood, 75); Small goldfish: 1st Mr. K. Kershaw (Heywood, 70); 2nd Mr. M. Cobbe (Belle Vue, 70); 3rd Mr. D. Smith (Tadcaster, 70); Large bars: 1st and 2nd Mr. G. Bailey (Castleford, 70); 3rd Mr. J. Lord (Valley, 78).

- Amphilophidae: 1st Mr. M. Cobbe (Belle Vue, 70); 2nd Mr. J. B. S. Powell (Bolton, 70); 3rd Mr. B. D. Watson (Oldham, 72); Fighting: 1st Mr. A. Whitlock (Tadcaster, 75); 2nd Mr. A. Newell (Glossop, 73); 3rd Mr. J. Lord (Valley, 78); Cichlids (small): 1st Mr. M. Webb (Salford, 72); 2nd Mr. J. B. S. Powell (Bolton, 70); 3rd Mr. D. Smith (Tadcaster, 75); Cichlids, large: 1st and 2nd Mr. E. O. O’Reilly (Southport, 80); 3rd Mr. J. Moorley (Glossop, 77); Cichlids: 1st Mr. M. Window (Oldham, 78); 2nd Mr. R. Dawson (Oldham, 77); 3rd Mr. M. Jones (Valley, 75); Characin (medium): 1st Mr. M. Webb (Salford, 72); 2nd Mr. K. Daniels (Merseside, 76); 3rd Mr. A. Birchall (Sunnybrow, 74); Characin, large: 1st Mr. H. Denton (Bolton, 80); 2nd Mr. K. Daniels (Merseside, 77); 3rd Mr. A. G. Girdler (Heywood, 76); Footnooks: 1st Mr. W. Orton (Salford, 78); 2nd Mr. D. Smith (Tadcaster, 71); 3rd Mr. M. Tonge (Oldham, 76); Danios: 1st Mr. F. J. Campbell (Bury, 77); 2nd Mr. J. Hippestall (Castleford, 76); 3rd Mr. D. Moorcroft (Salford, 72); Roundheads: 1st Mr. D. Foster (Bolton, 72); 2nd Mr. J. Lord (Valley, 78); 3rd Mr. R. Moorcroft (Merseside, 75).

NEVER important events closed 1969 for BETTINAL GREEN A.S. First was the A.G.M., at which the following officers were elected: chairman, Mr. J. Gower; secretary, Mr. P. Arnold; show secretary, Mr. A. Davis; assistant, Mr. J. Coombs; treasurer, Mr. J. Hay; P.R.O. Mr. A. Collins (11 Arrowsmith Road, Chigwell, Essex); committee, Mr. W. Newman, Mr. W. Williams, Mr. J. Adams, Mr. P. Brindley. This was followed by the Society’s first annual dinner and dance and it was a great success that it is sure to become part of the club’s annual programme. The highlight was the presentation of the year’s trophies by the Society’s resident lecturer, Mr Frank Tomkin. Members also visited in December A.S. for a return inter-club table show and while Mr Baker was judging the fish, Mr. F. T. S. Mitchell took fish in four classes for each team, members were competing in a Crass-Cross. A most enjoyable evening for Bettinal Green, since not only were they the victors in the quiz but they were also winners of the table show by 25 points to 15.

NEWS from WARRINGTON A.S. lists a number of interesting lectures that the club has enjoyed in recent months. Secretary Mr A. Addison gave talks on the accessories used with the aquarium and demonstrated this with a comprehensive range of filtering equipment and water pumps. An interesting discussion took place on what equipment was really necessary and best suited to the aquarist’s needs. At another meeting, Mr J. Walker was engaged but difficulties with the sound track marred the presentation. At a later meeting, Mr. J. Woonton, a club member, gave a talk on the animal kingdom. Recent table show results have been:

- Pairs, tropical: 1st and 3rd Mr. B. Philcock; 2nd Mr. B. Rowland; Pairs, tropical livebearers: 1st Mr. M. Baker and Mr. C. Mowat; 2nd Mr. R. G. Robinson; 3rd Mr. H. Greenhalgh; 1st and 3rd Mr. H. Greenhalgh; 2nd Mr. and Mrs Clarke; Mollies: 1st Mr. B. Rowland; 2nd Mr. L. Crawford; 3rd Mr. M. Baker; A.V. coldwater: 1st and 2nd Mr. J. Woonton.

THE BRISTOL T.F.C. annual general meeting was held at the end of a very successful season, the high-light of which was held to be without any doubt, the 1969 Open Show.
It was reported that this had attracted a record number of high standard entries and a committee has now been formed to organise the 1970 show. Show secretary is Mr E. Newman (71, Somerdale Avenue, Knokle, Bristol 4) and further details will soon be announced. Officers elected for the year are: chairman, Mr L. Littleton; vice-chairman, Mr A. Kember; secretary, Mr W. Holland; assistant, Mr C. McGrath; treasurer, Mr R. Yoone; reporting secretary, Mr K. Chapman (4, Howecroft Court, Eastead Lane, Stoke d’Abernon, Bromley 4); programmer officer, Mr K. Gale; librarian, Mrs P. Chapman. Award winners for the 1969 table shows were—open section, Mr F. Brown; novice section, Mr J. Smith.

It was reported that many very capable speakers had visited the club during the season and a varied selection of films were shown. A coach outing to London for The Aquarium Show in London proved very popular with members and friends and it is hoped similar visits will take place during 1970. An invitation is extended to visitors and prospective new members to attend monthly meetings (held on the third Tuesday of the month at the Swan Hotel, Stokes Croft, Bristol 1 at 7.30 p.m.).

SECRETARY OF THE FANCY GOURMET ASSOCIATION: Mr Fred Campbell sends us the following report. The combined Open Show and Christmas Party of the MANCHESTER SECTION of the F.G.A.: ‘The best laid schemes of mice and men, oft go awry’. Once more the annual words of Robert Burns were prompted by the mortal operations of Mr R. Ral, Mr J. Kelly, who delights in conducting the fun and games, report a great deal of time and trouble in preparing the programme. Unfortunately, when the festivities should have been starting he was on Paddysall station awaiting the train from London, which was conveying the Radlett contingent. It eventually arrived one hour and 20 minutes behind schedule. In time to prevent the guests from getting restless, however, the train capably driven, or should I say conducted, by Sam Croft, wound its way into the hall. It consisted of 20 units and, as it came to a halt, each one displayed a letter of the alphabet and announced collectively that they were the ‘Birmingham and a Happy New Year’. A wonderful idea, energetically carried out. Thank you Birmingham!

A QUERY raised by Mr R. L. Pollier in the Kai Newsletter No. 4 concerns the difficulty of obtaining pure blue koi. Mr Pollier writes: ‘I have never seen a pure blue koi to date. One must conclude that Japan is keeping such fish to herself; I would be very interested to learn if anyone has obtained one yet. I have four beautiful examples of blue but they all have red or some other colour in addition to the blue’. Anyone interested in the formation of a National Kai Club should write to Mr K. D. Fancuyt, Fantasy Pet Products Ltd, 12 Nuddly Lane, Regents Park, Surrey.

‘The Radlett party arrived shortly afterwards and the festivities were quickly in full swing. The highlight of the proceedings was undoubtedly the powers revealed by the Indian mystic “The Great Fag” and the audience were spellbound at his extra-sensory perceptiveness.

The Show, too, was a tremendous success, no less than 250 entries being berthed. Very creditable when one considers the late date and the vagaries of the weather. The advantage of being able to use a separate room for the show and exclude all but show staff and judges until after judging was fully demonstrated. Unfortunately, with a Christmas Party going on, the workers tend to become “out of sight out of mind” and, as the wine flowed our concern for their welfare was inclined to ebb. I am sorry, they must have done a great job, as they invariably do.’

MANY members of HOUNSLOW & D.A.S. may well be keeping memories after the interesting an detailed talk given by the Society’s new chairman, Mr Barry Abbott, on this subject. The table show was for labyrinths and was won by Mr Bert Pratt with a giant gourami (73 points); 2, Mr John Banham (dwarf gourami, 74); 3, Mrs Rose Brown (tick-up gourami, 22). At its AGM the Society heard the officers report on a successful year. Club meetings and social events had been well attended and the club could look forward to another year of growth. Officers elected: secretary: Mr Derek Woodward (34, Caxford Road, Hornswood, Middlesex); treasurer, Mr Harold Woodward; show secretary, Mr Bert Pratt; club secretary, Mr John White; librarian, Mr Eric Sheppard; national president, Mr Roy Brown; treasurer, Mr J. Hardie (Parkway, Slough). A.C.R.G. for 1970: Mr Bob Nolhan; finance manager, Mrs E. Davis; Mr Ted Dorell. SWILLINGTON A.S. prepared for their home furnished aquarium competition by arranging for a lecture to be given on the subject on a club night. The competition itself was judged by Mr J. Skinner and won by Mr D. Dickson, who received the Jeff and Marjorie Skinner Cup. The Betty was second and Mr A. Crossley third. The Society has also held its fourth members’ table show. Results of this were:

- 1st: Mr H. White, Mr H. White, Mr H. White, Mr H. White, Mr H. White, Mr H. White.
- 2nd: Mr A. Crossley, Mr A. Crossley, Mr A. Crossley, Mr A. Crossley, Mr A. Crossley, Mr A. Crossley.
- 3rd: Mr B. Nolhan, Mr B. Nolhan, Mr B. Nolhan, Mr B. Nolhan, Mr B. Nolhan, Mr B. Nolhan.

FROM the report given by SOUTHEND-LEIGH & D.A.S. on their activities at the end of 1969 it would seem that club members are enjoying a very active winter season. As a result of winning the inter-club competition held with East London and Thurrock A.S. the gavel and block trophy will remain in the Society’s care for the coming year. Although members were not successful in winning the inter-club competition held with Billericay Blackwater and Witham they pay tribute to the honours won by their club. The home furnished aquarium competition has been held and won by Mr Malcolm Lipton (3); Mr A. Crossley, Mr A. Crossley, Mr A. Crossley, Mr A. Crossley, Mr A. Crossley, Mr A. Crossley.

At the A.G.M., members heard that the Society now has over 50 members. Officers elected were: president, Mr D. Edwards; vice-president, Mr R. Passmore; secretary, Mr J. Norris (85 Leigh Cliff Road, Leigh-on-Sea, Essex); treasurer, Mr D. M. Chestnut; journal editor, Mr P. F. Capon; assistant, Mr R. D. Oxford; librarian, Mr R. Passmore; assistant, Mr E. Mitchell; P.R.O.; Mr H. Hall; table show secretary, Mr D. Finch; refreshment secretary, Mr R. and E. Bleasham; committee member, Mr S. Norris.

35 SOCIETIES were represented among the 456 entries at the 10th annual open show held by ABERDEEN & D.A.S. Held in the area to the end of the show was an Aberdeen itself with 69 points, Castleford with 14, Bradford with 20 and Salford with 19.
The classes were judged by Mr W. Catmull, Mr M. Jones, Mr A. M. Deakin, Mr B. Irwin, Mr J. M. Skinner and Mr G. Holmes and the following awards were made:

Inter-society furnished aquaria (1 entry) 1st Halifax A.S. 2nd Mr D. Fryer who received Peite’s Challenge Shield and A.D.A.S. Special Award; 3rd Nelson A.S. 4th Ampthorope & D.A.S. Novice Class (125 entries) 1st Mrs. M. Davis (Dewsbury) 2nd M. E. Watts (Flint) 3rd M. E. Williams (Huddersfield) 4th M. W. Green (Bolton) 5th M. E. Halsey (Bolton). 2nd February, ROTHERHAM & D.A.S. Open Show 9th March, HUDDERSFIELD T.F.S. Open Show, Cambridge Road Baths, Huddersfield. 16th March, THURROCK A.S. Open Show, Show Secretary, Mr D. Durrant, 22 Kingsman Road, Stanford-le-Hope, Essex. 22nd February, BOLTON A.S. Open Show, Dukinfield, Fernhill Road. 29th February, KINGSLAND A.S. Open Show, Show Secretary, Mr D. Durrant, 22 Kingsman Road, Stanford-le-Hope, Essex. 461

**Dates for Your Diary**

2nd February, ROTHERHAM & D.A.S. Open Show, Dukinfield, Fernhill Road, Schedules from Mrs C. Raybould, 52 Overcourt Road, Makeley, Rotherham.

1st March, KEIGHLEY A.S. Open Show, Details from Mr B. White, 1 Moss Carr Road, Long Lee, Keighley.

8th March, HUDDERSFIELD T.F.S. Open Show, Cambridge Road Baths, Huddersfield. 16th March, THURROCK A.S. Open Show, Show Secretary, Mr D. Durrant, 22 Kingsman Road, Stanford-le-Hope, Essex.

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24-26th April. STOCKTON-ON-TEES. A.S. Open Show. St. Peter's & St. Paul's School, Darlington Road (A171), Stockton-on-Tees. Exhibits by Mr. K. Chambers, 26 Thomson Avenue, Thornaby, Stockton.


9th May. MIDWAY A.S. Open Show (provisional).

11th May. ASSOCIATION OF YORKSHIRE A.S. Open Show. Details to follow.


14th May. SOUTHEND, LEIGH & D.A.S. Open Show. Southend Leisure Centre, Southend-on-Sea. Exhibits by Mr. C. Whitney, 47 Lewes Road, Blackheath.


18th May. BURBIDGE & D.A.S. Open Show. Mornington Community Centre, Bournemouth.


23-25th June. BRISTOL, T.F.C. Open Show. Congregational Church Hall, Newton Street (off Stapleton Road). Bristol. Details from Mr. E. Newman, 71 Somerdale Avenue, Knowle, Bristol.

26th June. NORTWICH & D.A.S. Open Show.

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8th June. ALBRETON & D.A.S. Open Show. Alrewas Hall, Alrewas, Darlaston. Details from Mr. W. S. Hill, 33 South Street, Riddings, Derbyshire.

8th July. HIGHWYCOMBE A.S. Open Show. West Wycombe Hall, West Wycombe, Bucks.


9th July. BASINGSTOKE & D.A.S. Open Show. Details from Mr. A. K. Blakie, 92 Bounton Road, Basingstoke, Hants.

9th July. GRANTHAM & D.A.S. Open Show. Grantham. Details from Mr. P. Carley, 15 Sydney Avenue, Grantham, Lincs.

9th July. BARNLEY T.F.A. Open Show. Venue to be arranged.


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