

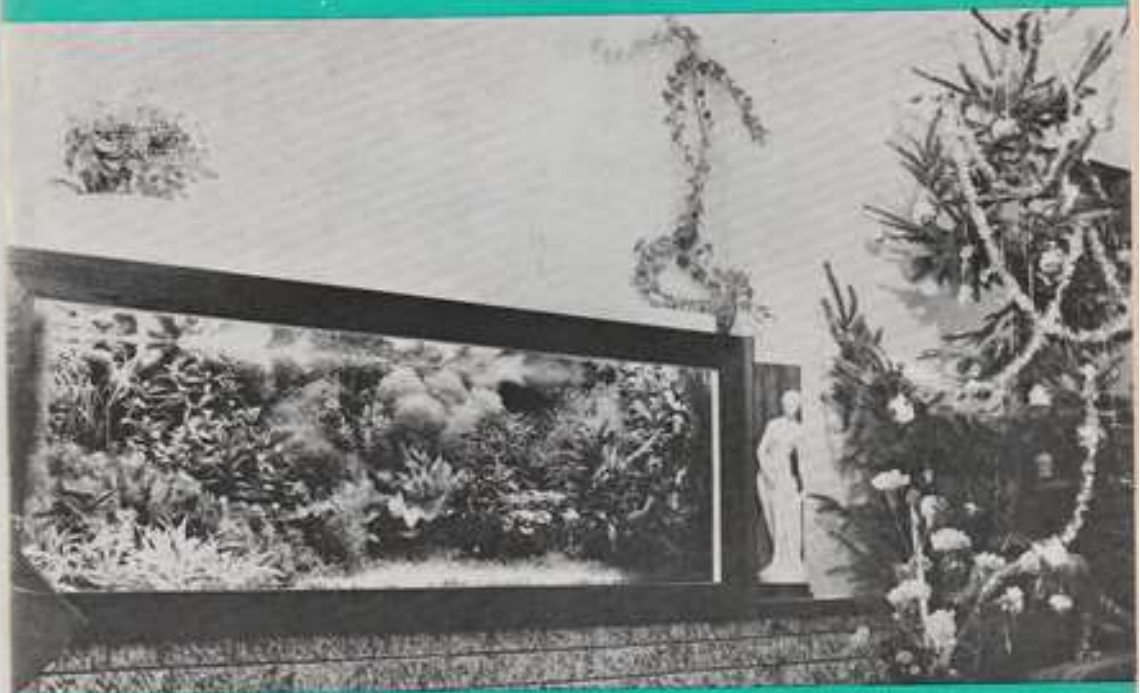
DECEMBER 1973

20p

Pet Fish

monthly

The PRACTICAL FISHKEEPING MAGAZINE



Contents include:

The Golden Gourami

Which are the Hardy Marines?

Fish Signals

Report and Pictures of The Aquarium Show 1973

'Little Toms'

Coldwater Scene

Personal Comment etc.



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The AQUARIUM SHOW 1973

A FLIGHT of robur fishes, moving tanks, a venetian gondola, Chinese pagodas, an Edwardian street scene in London—these were just some of the delights used as settings for aquaria that the Society tableaux designers had prepared for visitors to this year's Aquarium Show. The pagoda mini-tanks were the focal points of the **Hounslow & DAS** Chinese landscape, set in pine trees beside a lake complete with bridge and rickshaws. Rather nearer home was the mountain scene and summer camp that **Vauxhall Motors AS** featured. Venice at night was the inspiration for the dramatic tableaux designed

by the **Isle of Wight AS** (joint 3rd)—their competition space was filled with a canal-side scene where a magnificent red velvet-draped gondola glided on, its central shelter a brilliantly lit furnished aquarium.

The European theme really came to the fore with the representation of the recent twinning with the town of Nancy on the **Hendon & DAS** tableau. The red, white and blue national colours were draped against a finely painted backcloth depicting scenes from both towns (including Hendon's past aeronautical glories); central to the theme were the scroll and enamelled

plate presented to the British Society by their fellow aquarists in France.

The skills and workmanship displayed in the stands devised by members of **Basingstoke & DAS** (joint 3rd) and **Hemel Hempstead & DAS** (2nd) were impressive. Basingstoke's Edwardian London street scene, with its facade including a replica of the front of the Globe Palace music hall and tank skillfully incorporated above its partition, featured scale models of a bus and a train delivered to West Ham Corporation before the first World War and now in the British Transport Museum (though doubtless



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First prize-winning tableau by Portsmouth AS

mimic the aquaria that Baring-stoke's models featured), Edwardian pedestrians completed the scene.

Rumours of Hemel Hempstead's 'moving tanks' caused a fair amount of disbelief before the 'arriving' but, indeed, there they were!—two tanks in the shape of cable cars passing each other endlessly up and down throughout the show. Any public fears that the fish in the tanks might not like the sensation were permanently dispelled by the vigour with which the mountain minnow occupants spawned in their upward and downward journeying. Based on an idea by Mr Alan Tullis, 15 or 20 members of the Society, and in particular Mr Eric Beir, show secretary, and Mr Geoff Whitby, gave 2-300 hours' work on

realising the theme. Every detail of the scene, including the under-cliff walk with lighted lamps, and inhabitants (down to the pope stroked by the fisherman in the cove) were realistic; as were the sound effects that Mr Alan Gowlett obtained on a visit to the coast that caused one unsuspecting listener, at least, worriedly to try to assess the damage being done to the roof of the Hall by this sudden extraordinary influx of 'gulls'.

One of the features of this year's Tableau was the great number of furnished aquaria and aquascapes that were incorporated into the designs. The giant tank that Erith & DAS had planned as the show piece of their flower- and plant-banked stand came to a

disastrous end when it burst just before the tableau was completed. It is not easy to cope with such disappointments at 10 a.m. in the morning after a long evening of hard work but club members responded to the disaster magnificently and if the 'fish' in the un-sided tank that was all that remained were somewhat 'static', many of the other tanks on the stand brought the society success with a first and special FBAS award in class Aa. A tank in which the serpaie tetras reflected the rust red colour of the decorative bark used won the 1st award and special FBAS award in class Aa and there was also a fourth in Ab, a 2nd and 3rd in Ad, and a third in Ak.

Another tableau designed to give maximum emphasis to the fish and furnished aquaria was the

Rannymede AS 'fish house interior'. Cichlid parents and fry featured with a goldfish pond and an array of very fine aquascapes that won the Society a 3rd and 4th in class Ag, a 1st and 2nd in Ah and a first in Ak. This last tank was drawing many 'oohs' and 'aahs' from visitors as they peered in the watery cave made from a large, naturally hollowed out piece of bark with its moss and ivy trailings and brilliant-coloured fungi in the 'forest' gloom.

The array of mini-tanks in the **Piscus AS** tableau were grouped into the shape of the squares of a giant crossword, interminably lit up and carrying a variety of Siamese fighters. **United Independent AS** members Mr Dave Watts, Mr and Mrs Brian and June Salisbury and Mr and Mrs Stan Cowall were amongst those responsible for the fine display of furnished aquaria and aquascapes on their stand, and were instrumental in winning for the Society a 3rd in Aa, a first and special FBAS award and a 4th in Ad, a 2nd in Ag and a 4th in Ak.

So to the tableau that the other entering societies judged the best—the tropical forest scene devised by **Portsmouth AS**. For 6 years members of Portsmouth AS have given their support to The Aquarium Show and, like their fellow aquarists in the Isle of Wight,



Moving aquaria ('cliff lifts') by Hemel Hempstead AS (second)

have travelled no small distance to do so. It was therefore a great pleasure to everyone to learn that this beautiful, 'natural' tableau scene had triumphed. Massed tropical 'ily plants and greenery covered the mossy heights that fell to a waterfall and goldfish-filled stream, while above the watery scene zebras finches flitted and called in the 'branches' of the trees. Congratulations Portsmouth, on a splendid win.

Class Results

The results of the competitive classes at this year's Aquarium Show might well gladden the heart of any Women's Lib. supporter, since female competitors were awarded eight of the major trophies and it was Mrs R. Coyle of United/Ind.



Joint third—tableau by Isle of Wight AS



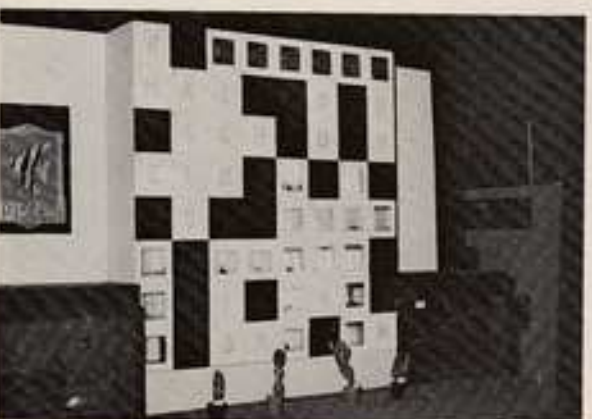
Joint third—tableau by Basingstoke AS

Show), won the Elain trophy for tropical egglayers, the FBAS Council trophy for the native and foreign coldwater class and received the E-Es trophy for the best exhibit entered by a lady. Another very successful competitor was Mr R. Barton of South London AS who received the Pet Library trophy for the coperpetitor with most points, the Hyko/Peterana trophy for dwarf cichlids, and the FGA shield for best female guppy. Mr D. Dare of the BKA won the Halsin Cup for best characin and the Scaeco trophy for entering the best fish in show, a *Dorichodus* flossus. Other special trophy winners were: Mr P. Mays of Sudbury AS, the first trophy for barbs; Mr T. Kinsey, United/Independent, the

AS who won the FBAS Supreme Championship Class with a chola barb that was awarded 82 points. Mrs H. Parrish of Hounslow AS won the Kennel trophy for labyrinth; Mrs M. Nethersell of Riverside AS received the Johnson trophy for best cutfish; Mrs Jarvis of South London AS won the first trophy for best danio or minnow; Mrs M. Taylor was awarded the BMMA shield for tropical marines; Mrs J. Salisbury received the Phillips Cup for the best individual furnished aquarium; Mrs Sybil Hodges of Bethnal Green AS, through not this time accompanied by the redoubtable Caesar (very much missed at this year's



Best cichlid at The Aquarium Show '73



Marsh trophy for best cichlid; Mr M. Collins, Hounslow AS, the Rena trophy for egg-laying toothcarps; Mr J. Batts, Ealing AS, the Inter-Pet trophy for catfish; Mr P. Coyle, United/Independent, the Tetraodon trophy for best rasbora; Mr R. Leslie, High Wycombe AS, the Longlife Medal for koi; Mr B. Chapman, Tambridge AS, the 'Trophy' trophy for best male guppy; Mr A. Blake, Basingstoke AS, the Pengelly trophy for platys; Mr J. Hines of Aston AS, the TFH/Miracle shield for molluscs; Mr W. Woodward, North Kent AS, the Boughton trophy for goldfish and the Longlife plaque for best coldwater fish. Mr Lewis Doubleday of the BMAA was awarded the BMAA Perpetual trophy for coldwater marines. The T. Hoerlein Rose Bowl for the best society furnished aquarium was won by Erith AS. The Taylor Smith trophy for the society with most points was won by United/Independent.

Detailed results were:

Supreme Championship Class: 1, Mrs R. Coker (United Ind., 82); 2, Mr D. Lamberson (Basingstoke, *Apistogramma* 1973); 3, Mr T. Taylor (Ealing, 86); 4, Mrs Susan (Erith, 79); 5, Mr A. Blake (Basingstoke, 78); 6, Mr W. Wright (East Dulwich, 77).

A: 1, Erith AS; 2, Isle of Wight AS; United Ind., AS; 3, Putney AS; 4, Harefield AS; 5, Basingstoke AS; Ad: 1, Mrs J. Salebury (United Ind.); 2, Mr T. King (Erith); 3, Mrs Davidson (Erith); 4, Mr E. Shepherd (Harefield); 5, Mrs J. Salway; 6, Mr J. Gantard (Basingstoke); 7, Mr J. R. Runnymede AS; 8, Harold Hampton AS; 9, Mr J. Shepherd (Harefield); 10, Mr Johnson (Putney); 11, Mr M. Thomas (Erith).

B: 1, Mr P. Mize (Bulbary, B. 1973); 2, Mr T. Taylor (B. 1973); 3, Mrs L. Newman (Basingstoke, 1973); C: 1, Mr D. Day (BKA, D. 1973); 2, Mr J. Brown (Croydon, N. 1973); 3, Mrs P. Pritchard (Farnborough, 1973); D: 1, Mr T. Kinnon (United Ind., T. 1973); 2, Mr R. Pevsack (Waltham, L. 1973); 3, Mr A. Cree (Waltham, P. 1973); D: 1, Mr B. Pevsack; 2, Mr J. Nathaniel (Harefield); 3, Mrs S. Hodges (Bethnal Green, B. 1973); 4, Mr R. Burton (South London, J. 1973); 5, Mrs J. P. Johnson; E: 1, Mrs S. Parry (Hendon, C. 1973); 2, Mr J. Jackson (Basingstoke, 1973); 3, Mr R. Burton (Culpe, 1973); 4, Mr R. Brown (United Ind.); 5, Mr A. P. Taylor (Harefield); 6, Mr R. Mrs Turner (Basingstoke); F: 1, R. S. Mr M. Collins (Hendon, J. 1973); 2, Mr G. Carruth (Hendon, J. 1973); G: 1, Mrs Nathaniel (Harefield, *Lates niloticus*); 2, Mr J. Hines (Aston, H. 1973); 3, Mr B. Chapman (Farnborough, J. 1973); 4, Mr J. Batts (Ealing); 5, Mrs Nathaniel; 6, Mr E. Adams (South London); 7, Mr P. Coyle (B. 1973).

Tableaux by Runnymede AS, Erith AS and Pices AS



Left: FRAS Chairman Mr F. Tomkins (left) presents the Calgary Trophy for best tableau to Portsmouth AS (Mr J. Stillwell representing). Right: Mr Sid Tarrant, member of the Show management team since the 1968 Show, drapes a stand during build-up.

left): 1. Mr T. Taylor (G. dorsalis); 2. Mr L. Beattie (Sudbury, B. longipinnis); 3. Mrs P. Lewis (South London, aculeus); 4. Mr T. Taylor (B. fuscus); 5. Mr J. Adams (Hastings, zebra stripes); 6. 1. Mr R. Latta (High Wycombe, blue variety); 2. Mr A. Lush (Mid-Herts, B. subdominus); 3. Master T. Cuthbert (Tad. shull); 4. Mrs. Haldane (Oxfordshire); 5. Mr T. Bullock (Derbyshire Green, Polygramma variegata); 6. R. Brown (not in show); 7. 1. Mr R. Chapman (Tunbridge).

2 & 3. Mr E. Harvey (Harrowood); 4. Mr R. Burton; 5. Mr R. Jones (Cotswold); 6. Mr J. Hows (Ayles); 7. Mr J. Pinner (Chingford); 8. Mrs Cress (Willingborough); 9. Mr & Mrs Martin (Tunbridge); 10. 1. Mr A. Blake (Hastings); 2. Mr F. Powell (Tunbridge); 3. Mr T. Taylor; 4. 1. Mr J. Howe; 2. Mr T. Jones; 3. Mr R. Burton; 4. Mrs Pinner (Tunbridge, blue variety); 5. Mr R. Thompson (Harrow, L. striata); 6. Mr T. Woodley (Harrow, Phaeocheilus amatus); 7. 1. Mr W. Woodward (St. Kent).

1. Mr K. Willis (Isle of Wight); 2. Mrs K. Hodges (Wey); 3. Mrs Longstaff (Wingston); 4. Mr H. Benge (Gilling); 5. Mr W. Woodward (N. Kent); 6. Mr H. Benge (Gilling); 7. Mrs Hodges (Lymington); 8. Mrs P. Williams (Harrow, var); 9. Mr R. Burt (St. Kent, Gilling); 10. 1. Mrs M. Taylor (Willingborough); 2. Mr A. Harroworth (Hastings, variegata stripes); 3. Mr L. Doolittle (BMAA, brown long); 4. 1. Mr L. Doolittle (BMAA, Blonnie, patterned); 2. Labea variegata; 3. Pomatoceros pictus; 4. Labea variegata.



Left: Sorting out the award cards at the Show is show secretary Mr Ron Kerridge (seated), aided by assistant show secretary Mr Dave Watts. Right: Mr R Wigg, one of this year's judges (other pictures on page 415)

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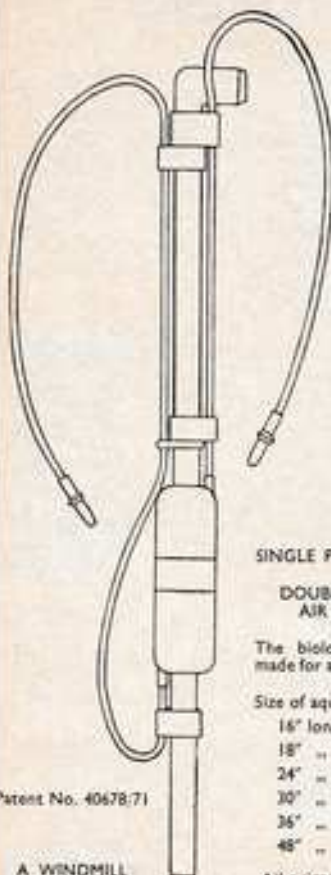
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Too High or Too Low!

I WAS most interested to see the letters of Mr W. F. Clark and Mr L. McCourt in the November issue of PFM. Their views on the prices of aquatic livestock seem to conflict somewhat. Before I read Mr McCourt's letter, I was intending to introduce a denunciation of Mr Clark's letter by saying that either Mr Clark had been dabbling in the delights of the real cream of the trade, or the prices 'Up North' are outrageous. However, Mr McCourt's views on the prices of fish, which no doubt have a bearing upon his need for profit in this field (not meaning to be personal), tended to make me think that the latter possibility was the more probable.

To come to the point, I feel that I must say to Mr Clark that the prices which he quotes for pairs of fish, if one is to vouch for the 'average' fish that one buys in the local aquatic centre, are considerably in excess of those which I have had to pay in this district (Surrey). I know that Mr Harrison, whose sponsorship Mr Clark appeared to be questioning, is from this district also, and I am quite sure that owners of aquatic and general pet stores alike, around here, could well say that he 'represents' themselves. Why, Mr McCourt himself recognises the fact that the '15p angel' exists, and indeed it is commonplace here, in both white and black lace varieties (blacks feature at 20p) and the price of a 'pair' is hardly in excess of double these prices. Mr Clark does not make clear the ages of the angels about which he writes, but I can say that, some years ago admittedly, I bought two white angels for 3/- apiece (note the non-existent price change), and about a year later, at a length of 4 in., they fetched £1 each, being, unfortunately, two females. I was told that £10 would have been paid for a pair of equal quality, which, Mr McCourt, shows the possibilities of the '15p angel' in the eyes of the somewhat inexperienced aquarist such as myself.

I cannot compare coldwater prices, unless Mr Clark is concerned with the 'Heinz 57' found in most pet shops, which would have been regarded as expensive at more than 2/- each when I was buying them some 5 years ago, and, quite frankly, I doubt whether shopkeepers get away with more than 12/p nowadays. So, that which appears to be a rarity along Clydeside is most definitely the norm down south. I would like to add also that live-

bearers, again of 'average' quality, fetch only 13p each; and sold in pairs or more, the price per fish is quite often reduced. Such also is the case of the common barbs and characins (may I remind Mr Clark of the history of the price of a neon tetra, which has dropped by a factor of six times or more).

Finally, in comparison of fish prices, I used to purchase fish from Mr Derek McNerny, before he emigrated to Spain, and his fish were of top quality. Male fighters he sold me at 12/6 each, and females at 5/- each, and here I like to feel that I was dabbling with the cream. Mr McNerny, by the way, also sold the multi-coloured off-casts of his guppy-breeding programme for no more than 1/- or 2/- each, these being in the best of health; and one of the angels I mentioned above came from his (good) stocks.

That, then, is the state of livestock in this area of the south (and plants, too, are very reasonably priced), which, for me, amounts to a non-existent price rise since I took up the hobby (not since decimalisation, anyway, for, to my mind, many devious goings on occurred at that time).

I must now apologise for being rather satirical in my comparisons, and for the fact that Mr Clark has had to bear the brunt of my feelings. I am, however, on your side, Mr Clark, and I commiserate deeply with you. It seems terrible that the seat of the hobby (that is what I am told the 'North' is) should suffer first from the dreaded economic force which will no doubt spread south sooner or later. Perhaps Mr Harrison has some foresight in this matter. Certainly, the prices of equipment and foods are high on intolerable here as it is; within 2 years nearly the lot have practically doubled in price. I leave the fighting to the Mr Clarks against the Mr McCourts in the North, and stand ready to wield my trident, should the need arise in the south, while C. Harrison Esq. gazes on through the mists of the crystal.

Little Tangle, Womersley, Surrey. S. M. JAMES

Coldwater 'Cats'

THIS is now the second year I have kept North American bullheads and, apart from very odd times, I must record that the interest they provide is negligible. As tank fish, a passing interest apart, they have little to offer. Certainly in the summer

A. melas does swim around a bit in the sunshine and its colours of black, blue, green and grey with a white bib look quite good. In winter it 'becomes' *A. nebulosus*—a brown fish with a white bib, which probably explains the confusion surrounding naming specimens. Past the tiddler stage, body shape could be described as gross as opposed to having contoured or flowing lines. The muscles of the body give a 'humpy' effect. The fish are for the most part shy and retiring. I have not bred them but, that apart, they seem to have shown all they have to offer in the first few weeks. When I find a place for them in an out-of-the-way corner where I won't be tripping over the bucket or whatever becomes their new home, my little 6-gallon tank is going to house a few tropicals.

Greenock, Renfrewshire

W. T. CLARK

Blind Cave Tetras to Spare?

I AM a keen aquarist and also a biology student. I had hoped to combine my two interests by making a study of the blind cave characin (*Anoptichthys jordani*) as a part of my course. Unfortunately there appears to be a general shortage of these fish at present. I have contacted several large dealers; and now I am writing to you in the hope that I may use the columns of your magazine for an appeal for help. Can one of your readers help me perhaps? I would probably be able to collect from the Midlands or the North West.

Flat 1, Bankhouse,
Slaughterhill,
Haslington, nr. Crewe, Cheshire

A. BLYTHES

Association of Goldfish Breeders

RESULTING from talks during the past months between goldfish breeders from various London clubs and the National Society, it was agreed to form The Association of Goldfish Breeders. The Founder members of the Association are Messrs. H. Bence, M. D. Cluse, L. F. Clements, R. Elsdon, W. L. Wilson, I. Fleming, G. A. Fleming, D. R. Nutt and A. B. Lawman and other goldfish breeders will be invited to join in the near future.

The intentions of the Association include the acceptance of all varieties of the goldfish and to

encourage the showing of individual breeders' work at their monthly table shows. To achieve by discussion and compromise National Standards for all varieties of goldfish, National Show Regulations, and to co-operate with all organisations who also believe these to be essential requirements for goldfish enthusiasts.

3 Rutland Road,
Wanstead, London, E.11

G. A. FLEMING

Catfish Show 1974

DU E to publicity and effort by founder members of the Catfish Association, the response for membership has been overwhelming. This has proved that there is a great need for more information on catfish. The divisions for FBAS classes G and H will be: Ga, Ameiridae; Gb, Auchenipteridae; Gc, Bagridae; Gd, Bunocephalidae; Ge, Callichthyidae; Gf, Chacidae; Gg, Clariidae; Gh, Doradidae; Gj, Helogenidae; Gk, Loricariidae; Gl, Malapteruridae; Gm, Mochocidae; Gn, Pimelodidae; Go, Plotosidae; Gp, Pygidiidae; Gq, Schilbeidae; Gr, Siluridae; Gz, 200 Cats, Ha, Brochis; Hb, *Corydoras* 2 in. and under (as FBAS size sheet); Hc, *Corydoras* over 2 in. (as FBAS size sheet); Hx, *Corydoras* not on size sheet.

On 9th March 1974 we will be holding an Open Show for catfish only, and with the approval of the FBAS we have split classes G and H (including pairs and breeders) into 18 different classes. We will not be using all the divisions from class G as many of these fish we do not see and some of the families only have one or two fish in them. Therefore we will only be using the following classes in the Open Show: Gc, Ge, Gg, Gh, Gk, Gm, Gn, Gq, Gr, Gz, Ha, Hb, Hc, Hx, NG, NH, XG, XH (making a total of 18 classes).

Another very important feature (possibly for the first time in the history of fish shows)—we will be sponsored and supported by a large industrial group—The Automatic Catering Supplies, a leading supplier to the vending machine industry. Make a note of the date—9th March, 1974 at Ham Hall, Ham Close, Ham, Richmond, Surrey.

N. E. SAWFORD
Secretary, Catfish
Association G.B.

A Merry Christmas and Happy Fishkeeping in 1974 to all our readers everywhere

The aquarium in the Christmas setting on this month's front cover was photographed by W. A. TOMEY



by
ARPEE

Personal COMMENT

ALTHOUGH it is possible to keep fish healthy with the use of non-living foods, we usually go to considerable lengths to provide them with a change of diet in live form, especially when conditioning for breeding or showing is in mind. I suppose this is all worth it—we have been assured by (virtually) generations of fishkeepers that the results speak for themselves. Or do they?

I sometimes wonder whether there isn't something of the 'muck and mystery' about all this from the nutritional point of view, as the analysis of most of the available flake foods reads like a cradle to the grave insurance policy. Any fish which take such material as readily, indeed, greedily, as they do, should look fit and be fit. In my experience this is just as things turn out and I should never worry if I knew I had to feed my freshwater fish on dried foods alone. I am rather less sure of their value as actual conditioners for breeding, but perhaps in this regard much depends upon the species. There is ample evidence that for individual species live food is totally unnecessary for average results.

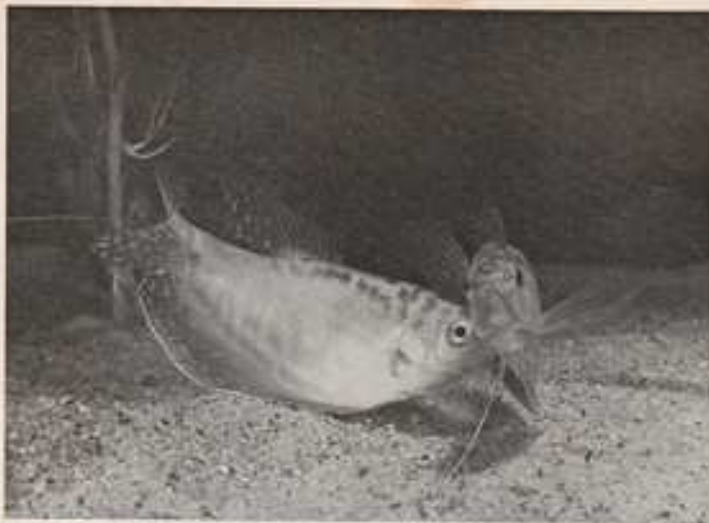
I assume therefore that we feed with live food because it gives fish a little something that the other sources haven't got, but so far nobody has quite quantified this so far as I am aware. No doubt live food acts as a stimulant to some bodily process which enables the fish to live more completely. From the viewpoint of the casual observer fish benefit most obviously when they are actually in the process of catching and eating live food, and perhaps in the wild there is some logical reason why they should act like this. It might be a warning to competing fish to sheer off, or further to force their prey into submission when they appear to glisten more brilliantly, to deepen their colours or to 'rattle' or extend their finnage or opercular regions. Whatever the explanation, it is of considerable satisfaction to both fish and their owners that live food is available from time to time, if only because the former have the time of their lives—or so it seems—whenever the opportunity is offered.

Just as it is unwise to concentrate on one dried food for your fish—they seem to appreciate variety as much as we do—it may be equally unprofitable to rely on one live food or one type of live food all the time. Just because whiteworm and tubifex are available throughout the year it would be totally mistaken to regard these as the sole prescription. Even these have their failings or limitations, and if one studies the whole range of what is available at one time or another, it will be found that, like pork or hen eggs, there are optimum periods as well as quite awful ones for their utilisation.

I have attempted some form of tabulation here to show how the main sources could be regarded

	Earthworm	Whiteworm	Tubifex	Daphnia/cyclops	Grain larvae	Aphids (greenfly)	Houseflies	Fruitfly	Brine shrimp fry	Brine shrimp adult	Microworm
January	×	A	A					A	A	A	A
February	×	A	A					A	A	A	A
March	×	A	A					A	A	A	A
April	A	A	A			A	A	A	A	A	A
May	A	A	O	A	A	A	A	A	A	/	A
June	A	A	O	A	A	A	A	A	A	/	A
July	A	A	O	A	A	A	A	A	A	/	A
August	A	A	O	A	A	A	A	A	A	/	A
September	A	A	O	A	A	A	A	A	A	/	A
October	A	A	A				A	A	A	A	A
November	×	A	A					A	A	A	A
December	×	A	A					A	A	A	A

A, Readily available. ×, From storage pans. O, Deteriorates rapidly in hot weather. /, At their most prolific.

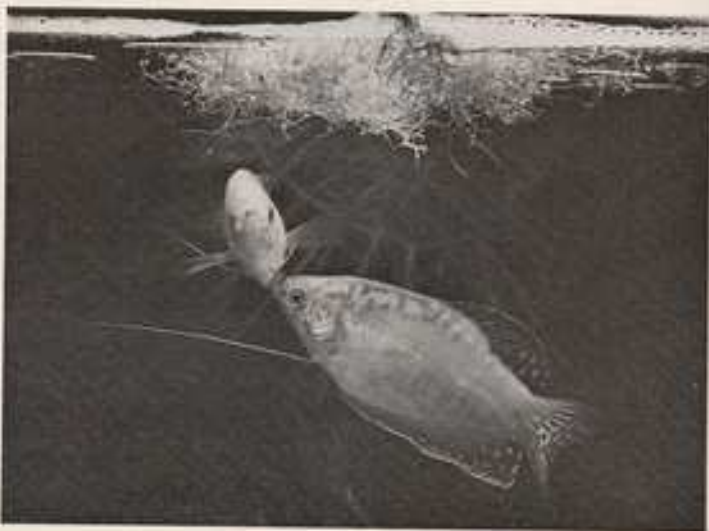


A skirmish between two males in the presence of an egg-laden female (see the photograph on the preceding page; the female is the right-hand fish).

and the hatched fry with sufficient oxygen for their requirements even in the poorly oxygenated waters they are likely to encounter in their natural habitat. Also, this way, the eggs are not so susceptible to fungus as they would be if they were dropped in the more usual way. The ejected eggs are very light and rise to the surface of the water; and there

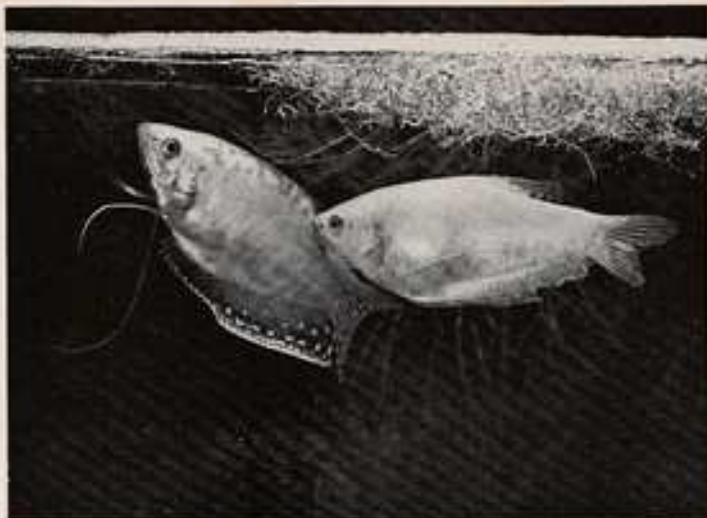
the male collects them up and places them in the nest.

The fish will build their bubble nests in a community tank and spawn there as well (if the fry are required it is safer to remove the eggs and nest by means of a large spoon so that the young can be reared in a separate tank). But if the fish are to be



The male (lower fish) has not completed the bubble nest and repulses the advance of the female into the nest area.

With bubble nest adequately reinforced with floating water plants the male seeks out the female, entices her beneath the nest and by nudges she shows her readiness to spawn.



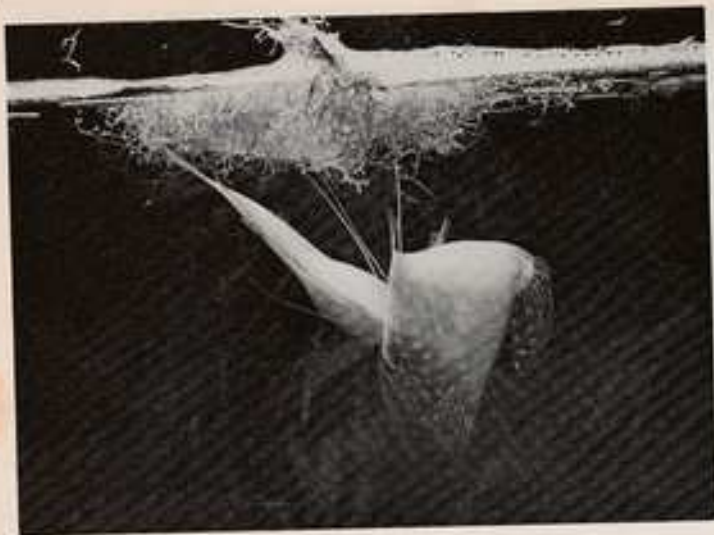
spawned in a breeding tank a largish tank is required with a lowered water level at a temperature of 78-82°F (26-28°C) (the water hardness is not critical). The eggs hatch in about 36 hours at a temperature of 82°F (28°C)—the length of time can sometimes be less than this but not longer.

Once the fry hatch, the male, who has been

looking after the eggs, can be removed (the female should be taken out immediately after the spawning has taken place). Immediately the fry are free swimming (on the fourth day) they must be provided with egg yolk or brine shrimp nauplii. The fry should be kept in a depth of water not greater than 6 in.



As the male curves his body the female swims into the embrace, immediately under the bubble nest. The commencement of spawning is shown in the picture overpage.



The male turns the embraced female so that her ventral (under) surface is uppermost, and in this position her eggs are released and fertilized.

Personal Comment

continued from page 398

gadgets and certain food manufacturers have had something of a field day, and the patent medicine boys haven't done so badly either. A way of injecting realism into the subject is to set a price on an average tank—say £4, and to divide into this the cost of any given article. I am now being asked to pay 50p for an ounce of fish food by a well-known company producing flake food, and as I don't consider this worth an eighth of my tank, I am going to stop using it until it comes down. I am persuaded in this argument by the fact that another continental competitor is marketing very similar food at less than half the price, so I shall give this a try as well as put my whiteworm cultures lightly and urge them into greater production! It will certainly pay the aquarist to shop around a bit when topping up his food supplies—even if there are no actual bargains, the change of diet will, most probably, do a power of good.

Air pumps seem to have followed a slightly odd pattern. In my beginner days the mere possession of an electric pump put one into the élite, and there is little doubt that the cheap diaphragm

machines now on the market are wonderfully good value. So are the powerful, expensive ones. What is missing is a really effective equipment in the £5 region—I have said this many times before, and nothing has emerged in the past 5 years to change my opinion.

Perhaps the most surprising pricing inequality is that applying to medicines, and if the fishkeeper reads up his subject he will find that he can equip his medicine chest far more cheaply by visiting his chemist with a shopping list derived from the more responsible sources, than by picking attractively packaged bottles of fish cures from the shelves of every pet shop in the district. Let's face it, there are very few medicaments which will restore fish to good health. They are frail things and life leaves them all too quickly. Probably more fish are killed by the cures than the diseases, and the price levied for this quackery gets higher all the time. Their value must relate to their proven, consistent effectiveness, and there are not many which have good records in this respect.

In the long run, whether prices are right or wrong to the individual will depend on how he has spent his money, and nothing is more true these days than the notion that you will only get value if you pay for it. Take advantage, therefore, of low fish prices, and equip to the best of your financial ability in order to achieve efficient working systems, which means trouble-free systems. The fact that living things may be cheap is no licence to treat them cheaply.

COLDWATER SCENE



By FRANK W. ORME

AS far as fish-keeping activities are concerned, the month of December is a quiet time of the year for the goldfish breeder. It allows time to sit back and reflect upon the failures and successes of the past season. In anticipation, thoughts range far ahead with dreams of the results of possible matings next year. 'That young male has developed well and made quite a nice fish, ideal for breeding with. Hmm, now if it were paired with that half-sister of his mother that has done so well in the local shows they should produce some really stupendous young. . .', and so, in the mind's eye the hordes of perfect fish are visualised. Of course, it never quite works that way; the reality seldom, if ever, lives up to the dream, but we continue to plan and dream as we try and then try again.

Whilst Lady Nature endeavours to frustrate us, by making our fish attempt to revert to their original form, with all of our skill and experience we work to thwart her intentions. By selective breeding we not only preserve the fancy goldfish but do our utmost to improve it. By hard culling we reject those fish which show signs of obeying the dictates of Lady Nature and keep only those which conform to our ideals of body shape, finnage and colour.

The percentage of worthwhile fish obtained from a spawning is invariably smaller than we would wish, but we persevere and make progress slowly. Unlike the breeders of most other species of fish, the goldfish breeder can never be certain, nor can he forecast with accuracy, what the quality of the young will be that are produced from the spawning of any particular pair of goldfish. The quality can vary from spawning to spawning and the disappointments are many. The continual anticipation, endeavour and frustration, always trying but never quite achieving our dream of the perfect fish—this, for me, is part of the fascination of goldfish breeding, and to know that the young fish are the result, in a small way, of your skill in selective breeding.

There is not, nor can there be, any short cut to obtain the perfect fish. However, reasonably consistent results can be achieved provided that you are prepared to practise some form of line-breeding and establish a pure strain of the chosen variety. The person who attempts a short cut to success by mixing different varieties is, to be blunt,

Do We Need a Register of Recognised Fancy Goldfish Breeders?

a fool! He does a great dis-service to himself, to his fish and an even greater one to the poor unsuspecting purchaser of the resultant young. If you are tempted to cross-breed varieties—don't! Resist the temptation if you value your good name amongst fellow hobbyists. In one short stroke you can undo years of work. Remember that it has taken centuries of patient breeding by the Chinese and Japanese to bring the present-day fancy goldfish to the forms which we know.

My advice to the newcomer to goldfish keeping is that he should obtain the best stock that he can afford from a reputable breeder. Should he decide to keep more than one variety try to choose types that are totally dis-similar. There would be no temptation, for instance, if the chosen varieties were Bristol shubunkins and veiltails. The fish are so unlike in both body shape and finnage that nothing would be achieved by crossing them. If, however, blackmoors and veiltails were selected and subsequently crossed, perhaps thinking that this would give a higher percentage of blue, it might possibly appear that an improvement was apparent in some of the young. These young fish will, nevertheless, carry the gene for 'telescopic eyes' and future generations will produce fish that exhibit this feature, which will prove quite difficult to eradicate. Of course, anyone who is unlucky enough to buy these fish, and who later decides to breed from them, will more than likely be using a brother to sister cross and this will greatly increase the possibility of a large proportion of telescope-eyed fish being produced.

I repeat, on no account should different varieties of goldfish be cross-bred. Keep your breeding lines pure and with time and patience the results will come, especially if the initial fish are obtained from an established breeder. It is more than likely that the breeder will have devoted years of dedicated line breeding to produce the fish which you purchase. You, therefore, will commence where he left off, which gives a 'flying start' to your breeding efforts.

* * *

Is interest in coldwater fishkeeping reviving? It would seem so if the past year is anything to judge by, for during that time I received an increasing number of enquiries from people who were

returning to the hobby, having previously kept tropical fish (a fair proportion were also hobbyists who had decided to change to coldwater). If this is a general trend throughout the country it is a trend that should be encouraged and is one that the majority of coldwater aquarists will welcome. In general, the enquiries were for lionheads or veiltails; however, I was also asked for the names of breeders of other varieties and/or types of coldwater fish which I do not keep. In most cases I was able to supply the required information, but in some cases it was difficult or impossible to give an answer.

Are there any breeders who specialise in producing good quality nacreous fantails? I know of no one who specifically breeds this variety of goldfish and therefore had to suggest various dealers and importers as possible sources of supply. It seems, to me, that a register of breeders of the many types of coldwater fish would be the answer—but—would it be a feasible proposition?

Such a register would merely need to state the breeder's name and address, the type of fish that were bred together with a note of whether fish could be despatched or had to be collected. This would enable the would-be purchaser of a particular sort of fish either to locate or be directed to the nearest source of supply. Would breeders support such a register? Now there is a subject to debate in the 'Letters' columns of PFM.

* * *

Many of the submersible water pumps are capable of being given an overhaul. The manufacturers' instruction sheet will state whether this is recommended for their particular model and, if so, how to set about it. The Otter is a pump that benefits from regular annual maintenance. The task is very simple and uncomplicated and now is a good time to attend to it. The pump will then be in good working order ready for use next year.

First check over any extension cable or connectors. It is unlikely that the cable which is connected to the pump will be found to be faulty, but it is possible that the extension cable or connections may require some attention; if they do, then put everything right now. It is better to be safe than sorry! Next undo the screws at both ends of the pump (four on the impeller chamber, or front, and two at the cable end). Remove the plastic mouldings, which will expose the impeller blade and the end of the armature shaft. Place a screwdriver blade into the slotted end of the shaft, to hold it steady, and unscrew the blade from the other end; the armature and shaft can now be withdrawn. All parts, including the motor housing, should now be thoroughly washed and dried. If it is found that the armature has rusted it can be lightly cleaned with steel wool and rewashed.

Drilled into the motor housing are holes, one to each bush; these can be cleaned out with petroleum jelly. The armature and shaft should also be greased by a smearing of the jelly.

Having cleaned and greased the unit it can be reassembled and stored away until required next year. This easily performed task will ensure that the pump is in good working order and will greatly extend its working life. Some years ago I purchased one of these pumps for 30 shillings from a dealer, who told me that he had paid a customer 5 pounds for it, but when he tried it the pump did not work although it made a humming noise. When I got the pump home it was stripped down, cleaned and reassembled. It has worked perfectly ever since. The cause of the pump's failure was a choked impeller chamber and a rusted armature!

* * *

Many goods, nowadays, are packed in blocks of expanded polystyrene for protection. This material is also used for buoyancy purposes and is therefore ideal for making floating feeding rings. Obtain a piece of this 'foam' approximately 6 in. square and 1 in. thick; a scrap piece of 4 in. plastic pipe $1\frac{1}{2}$ in. deep is also required. File one end of the pipe into a reasonably sharp edge, place it centrally upon the block of foam plastic and then, with a firm pressure, twist to and fro until the pipe has cut right through. Carefully push the centre out. With a fretsaw carefully trim the plastic foam so that a 1 in. collar is left around the pipe and the ring is completed, ready for use. Float the feeding ring upon the water with the exposed $\frac{1}{2}$ in. of pipe on the underside; this is done to prevent the food escaping from under the ring, which owing to the lightness of the foam, it would otherwise do. A similar type of ring can be made for aquarium use if 3 in. plastic rainwater pipe and thinner expanded polystyrene, such as ceiling tile, is used. These materials can often be found on building sites, or you would probably be able to obtain the odd bits of pipe from your local plumber.

A chat with this gentleman may well reveal that his putty is supplied in small plastic buckets and that for the price of a drink he would be only too pleased to let you take a few off his hands. If given a good wash in hot water they become ideal for transporting the odd fish or so to your club table show and, like me, you will more than likely find many other uses for them.

* * *

With the nearness of Christmas it is possible to start dropping hints that an appreciative reception would be given to those odd items of additional equipment, such as heaters and thermostats. If you do not already possess them it might be

worthwhile muttering the titles of two books within hearing of receptive ears. They are THE GOLDWISH by G. F. Hervey and J. Hems and GOLDWISH GUIDE by Dr Y. Matsui. If you are lucky and they appear in your Christmas stocking you will find that both are well written, and contain a lot of information that will provide interesting reading for both the experienced and novice fishkeeper.

Once the Christmas period has passed I start to look forward to spring and the coming fish breeding season. Mentally I compare the merits

and potential of this fish as opposed to that fish, and consider possible pairings. Of course, when the season commences it is quite possible that the present decisions will be changed and totally different fish used. This anticipation is part of the pleasure which the coldwater hobbyist gets from his breeding activities, and that statement has taken this month's article full circle to the opening paragraph. On that note I should like to give all readers of 1974 the traditional greeting of 'A Merry Xmas' and the wish that the New Year will prove to be a successful year for all fishkeepers.

MARINE PROJECT — 2 YEARS ON

Which are the Hardy Marines?

By ROY PINKS

WHEN I first started reading about the various species of fishes I might find it possible to keep alive in my saltwater tank, I thought that I would be content with the commoner, hardier species, especially if I were able to keep several of each kind in reasonable harmony. It struck me as absurd to attempt to keep an enormous angel and little else in a 30 gallon tank, as, knowing myself as I do, I reckoned on looking for greater movement, variety and experience than this single-minded alternative offered. On the whole I have not shifted far away from this viewpoint, and I would settle any time for a tank of numerous small fishes and one single largeish fish like a butterfly to act as a foil.

I have found it difficult to build up shoals or groups, though I have tried quite hard. The most striking would be *A. percula*, the common clown, and I have had limited success with them. They perform in this rôle very nicely until they fall victim of one malady or another, and are particularly vulnerable to oodinium, not only on introduction to new quarters, but subsequently and often. Given that this could be overcome in some way I cannot imagine a more charming and arresting sight than eight or ten of these wonderful little fish weaving and dancing their way through the water. I have found them very trustworthy at the 1½ to 2 in. mark, and if kept 'tight' they will not grow much; at the larger sizes they can prove difficult, and thus lose their appeal as shoal units.

A very worthwhile alternative may be offered by species from the *Chromis* group, though the types commonly offered for sale are probably not the most effective because they tend to grow rather larger than we want them to for shoaling in the

smaller sized aquaria.

A small yellow-tailed blue *Chromis*, of which I acquired a few specimens some time ago, seemed promising, but these were bullied to death by a large damsel just when I thought they had really come to stay. One of the most attractive small fishes I kept during the first 2 years of the project was the striped chromis. This was a 2 in. specimen which scored on every point I could think of, but which died most surprisingly of an unidentified virus after a few months of conspicuous success as a small community fish. I am constantly on the look-out for a replacement, though I think I shall get them in the plural when next they are obtainable.

I had neon gobies or cleaner wrasse more or less throughout the project, but I honestly regard them as less essential than I originally thought them to be. I think it has been well established that in the natural environment the cleaners and their customers complement one another adequately. I am much less sure about the real situation when both are in artificial water and unattended by the countless forms of minute life which exist in Nature. It seems likely to me that captive fishes, thanks to our copper sulphate, other medications, and to the comparative barrenness of packaged seawater, are clean by comparison with their naturally free counterparts and somehow do not offer to the cleaners the bounty to which they have been accustomed. There seems to be a lot of activity by the cleaners on new introductions, then gradually the association drops off, whether due to the ageing or indifference of the cleaners or to the diminution of genuine business with the clients, I do not know. The cleaner has often

appeared to hurt the client, who retaliates violently, though I have not observed any activity which could be construed as being positively harmful. The cleaners seem, by and large, worth inclusion. Their bluish hues and engaging method of locomotion make them striking additions to any community and they get on well with most other fishes.

I had indifferent results from the copperbands and the *Hemiochus*, both of which I cherish greatly. The former looked settled, then suddenly succumbed, and the latter seldom looked as though they had really come to terms with their new environment. I have not replaced the last copperband I lost, but am keeping the vacancy open for a second *Hemiochus*, to join the present rather lovely specimen I obtained a few months ago. There are views that, as these are shoal fish naturally, they stand a better chance of progressing in captivity if they are not singletons, and I may well be persuaded to put this to the test.

A 3-in coral beauty dwarf angel has turned out to be one of the most reliable and undemanding of the fishes introduced during the past year, and has never really looked in trouble. There are more striking fishes, but few are as distinguished as this glorious species. Violet-blue, red and orange mark this as a real aristocrat, and I can very thoroughly recommend this fish to the owner of the 30-40 gallon tank who wants a larger fish to contrast with smaller ones. There is a yellow species, too, which is also outstandingly attractive.

I contained my eagerness to possess many butterflies in deference to their need for greater space than I usually had available, but one little *Chaetodon octofasciatus* has come along really well during the 18 months I have had it, and this is my own personal success story, as it once declined food for about a week and was only restored to normality by copious additions of brine shrimp to the tank. As it has the reputation of being a 'difficult' fish, I am not a little pleased that it is now as fit as any I have in my small collection. Strangely enough, it has always been most unpopular with other species, which head it off as soon as look at it, though the antipathy seems not to have progressed to the stage of physical violence.

Of the smaller fishes, I have lost all my dominoes and blue damsels. On the other hand, my original little yellow-tailed blue damsel, the tomato clown and the yellow-tailed pink damsel are thriving most wonderfully, though the first named has scarcely grown during the 2 years I have had it. I have a great fondness for this diminutive fish, as it was the first one of all. It has lost bits of its tail and fins and grown them again and it has stood firm when the pink damsel, now vast by comparison, tries to lord it over all others. It has, above all, retained that quite unbelievable colouring of richest blue which first attracted me to it, and has quite lost the

fear which almost petrified it when we first had it.

The *Daneyllus* have come and gone, but have generally proved reliable, and I should hate to be without one, preferring the *arowana* to the *melanurus* for some obscure reason. My saddest losses were the file fish, whose lugubrious and bewildered air endeared them to all who met them, and my task for the winter will, I think, be to test whether they survive in pairs or trios where, as singles, they failed. It could just be that herein lies the solution of the shoal problem, but whether the result will prove aesthetically satisfying to the beholder depends on his appreciation of the finer points of a pack of eccentric submarines, so I may need to look further.

Summing up, I would strongly recommend the beginner to curb his ambitions for the first year or so and to explore the full possibilities of the cheaper fishes. It is commonly asserted that one can only have one of each species in any given tank because they will otherwise fight to the death, but I believe this to be quite untrue if a large number of similar sized fishes are introduced to a tank simultaneously. The temptation to add fish after fish until one dies should also be resisted—plan the collection as sensibly as you can, allowing adequately for growth, and above all, don't buy fish clearly too large for your tank just to be one up on the chap next door. It is worth remembering that the tank full of single striking specimens often looks a distracting mess, whilst one such showy specimen dominating a scene containing numerous lesser fish will really stop the traffic.

Effect of Tank Environment

I was interested from the outset of this project on the way in which fish would ultimately settle to the sort of tank conditions we would normally be able to provide. It was difficult to believe that I could for long preserve the colour and quality of the specimens I saw in the dealer's tank, because the books referred alarmingly to the rate at which tropical marines grew, and to the loss of their wonderful colours with increasing age.

These two tendencies need to be carefully studied and recorded, because it seems that they apply to some species but not to others. If clear patterns emerge it may be possible to plan collections far more satisfactorily than at present, when buyers often have only the haziest notions of what their fish will look like in 6 months' time, let alone the 6 years which may soon become the survival norm. I am very agreeably surprised at the way in which my surviving original fishes have retained their colour, and when one bears in mind that they were 'starter' fishes, their overall progress has been everything one could have wished for. It may be recalled that one of my early aims was also to restrict the rate of growth of these fishes by crowd-

ing them a bit, and in general this has been achieved, at least to the extent that no single specimen has developed into monstrous proportions and none, either, has grown very much.

The blue-finned pink damsel has developed in greater proportion than any of the others, and has become a very fine fish indeed. Although records on the normally attainable size of these fish are sketchy, I have every reason to believe that containment within the size of tank we usually manage to muster will keep many of the commoner fishes within the sort of bounds one would expect in a freshwater collection. There are notable exceptions, and one must expect the scorpion fish to fill a tank rather as a tinfoil barb does, though the ultimate effect is somewhat different! Otherwise, it seems that if you allow a fish enough room and feed it often and well enough it will assume handsome proportions. The majority of mariners will hardly want to do this because they will want as many diverse species as they can accommodate. The converse of this process, applied with commonsense, will enable a number of smallish fishes to be kept which look just as fit as their larger counterparts; the factor to watch most is overcrowding. It is one thing to sail close to the wind, and quite another to throw all caution to it.

On the whole I have tended to buy medium to small specimens, realising that in some cases survival would be unlikely. This caution has been prompted by the ever-present worry that larger specimens would turn out to be beyond the optimum holding capacity of the tank. Apart from this rather nebulous concept I feel that many of the larger specimens one sees for sale are quite disproportionate even to the dealer's tank, let alone my smaller ones. The visual incongruity apart, there is tremendous turbulence from large and active specimens which the aquarist will often regret after purchase. The creatures look imprisoned and their efforts to regain the depths and breadths they have known are upsetting to the onlooker and the fish alike.

As with most experiments I have found this one very much of a mixture. It is rewarding to have mastered some of the elementaries and to have found out a few things about the fishes I selected as subjects. It would be wrong to conclude from this that I think that tropical marine fishkeeping (whatever this is) is just another piece of cake. For good results it requires a degree of dedication which many simply cannot spare, and I am far from satisfied that we have thoroughly disposed of the problem of keeping a very wide range of species alive. Some still defeat us. We are thus very much at a threshold and need to proceed much more deliberately than many would care for. Some mariners are so busy dashing around butterflyflying from one part of the specialisation to the other

that they forget that they are, by so doing, only covering the same superficialities as scores of others. Longer time of dwell is therefore needed on the sub-specialisations within the main subject, and even more so on the individual species.

We should try more, I think, to look really closely at the blue damsel or the tomato clown, and I think many who have felt round all the corners already are coming to the conclusion that only by adopting a more responsible attitude will the mysteries of optimum management, even breeding, become clearer. Cheap marines for the millions is a parrot cry one often hears, but I utterly refute it. It is fine moneygrubbing propaganda which will appeal to some, but the time has not yet come at which it makes much sense. I am more than happy to see marines quite highly priced and available in limited (but not restricted) quantities, very largely because this state of affairs makes buyers think. Anything which makes people think has potential to induce them to learn, and nearly every single thing about this project has said loudly to me that we are still in great ignorance about tropical marines.

To those who point back over the years to the thirties when the breeding of the neon was so impossible, and conclude that because this was ultimately simplified, ergo tropical marines will soon join the great company of mastered problems, I would ask just one question. Do these master over-simplifiers really compare the technology of the two periods and come to the same conclusion? The vast resources at present available to man in attempting to resolve problems such as the survival and breeding of captive tropical marines has made startlingly little impact on the subject, and I fear there are many years of continuing bleak ignorance ahead. The researches, empirical though they may be, of the patient and thorough aquarist may prove invaluable in discovering the elusive key to the unknown processes. Although I have kept a few fishes alive for 2 years or more, this is hardly tropical marine fishkeeping. I think we need to look for further techniques for keeping and breeding some of the commoner species fairly simply, and within the financial means of the average fishkeeper. I doubt whether excursions into the 'Natural System' or into sophisticated control systems are the answer, mainly because they are so very expensive, though undoubtedly these are partially successful in skilled hands.

In concluding the notes on this highly enjoyable project, I should like to thank all those who have responded in print or more materially. It is very clear that the original series stimulated no end of thought on what is becoming a highly popular subject, and I am very grateful for the kind and generous response from so many readers.

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'Little Toms' Appear in London

By P. F. CAPON

(Southend, Leigh and District Aquarists Society)

RECENTLY Jim Connelly of Bethnal Green Aquarist Society came to me with a tale of a most peculiar 'livebearer' that he had seen in the tanks of an East London aquatic dealer. His description was of a small colourless elongated fish, the male of which carried a gonopodium which seemed out of all proportion to the body of the fish and which had curled hook-like rays at the tip. Now, only one fish, in my experience, has such a preposterous anal fin—*Tomeurus gracilis*. I first learnt of this oddity by way of an article written by the late Myron Gordon back in 1955. At the time I remember wishing to own some of these fish and promising myself that if ever I came across any I would purchase them, but as the years passed memory faded and the ambition was forgotten.

Now in October, 1973 it appeared that the fish was available. Within an hour we were studying them in the dealer's tank. Jim's description had been accurate: they were *Tomeurus*—no other fish has a gonopodium of such distinction! The tank contained somewhat over a hundred of these fish; the label on the aquarium referred to them as 'glass characins', but who am I to criticise the dealer, with thousands of fishes arriving in each shipment, for not readily identifying a fish that does not appear in any of the standard reference books available to the aquarist (except for a photograph taken by Sam Dunton of the New York Zoological Society, which appears in the 1957 edition of the *ENCYCLOPEDIA OF TROPICAL FISHES* by Herbert Axelrod and the late William Vorderwinkler). Indeed, if he had been able to positively identify them maybe they would have all been sold before I even heard about them being in stock.

Against the advice that I would give to other aquarists I purchased five. I say against the advice because many of the fish in the tank were in a poor state, with perhaps 10% of them suffering from swim-bladder trouble and the surface littered with dead and dying fish. In addition the only other occupant of the tank was a 'sting-ray', which I observed to eat three *Tomeurus* whilst we were netting out specimens. The *Tomeurus* normally swam in the top 2 inches of the tank but fear of the net drove them into the lower reaches where the

ray was able to trap them, with its mantle, against the glass.

My five fish, carefully selected for apparent health, were three males and two females. They had to remain in the plastic bag for 5 hours before reaching the warmth of my fish house and in this time the temperature dropped to 60°F. One of the males, the largest, of course, was by then in trouble, unable to swim upright; he died within a few hours.

Tomeurus gracilis was first described by Eigenmann in 1909 and comes from Guyana and Venezuela. Originally it was placed in the sub-family Tomcurinae in the family Poeciliidae; in 1947



Author's sketch of his *Tomeurus gracilis*, a recent import to the U.K.

Myers placed it in a separate family, the Tomeuridae, as the sole representative, because although it bred by internal fertilisation it was not a live-bearer but laid eggs. Professor G. V. Nikolshi of the Soviet Union even went so far as to suggest it should belong to a super-family the Tomeuroidea because of its uniqueness. In 1963 Rosen and Bailey returned it to the Tomurinae as the only oviparous sub-family in the Poeciliidae family.

John T. Van and Clifford Pope, working in 1929, under the auspices of the New York Zoological Society, came across the fish in the tidal reaches of the Essequibo River in Guyana. They reported on it to the Society and on their attempts to keep it in captivity. They told of its being a surface-dwelling fish which tended to hide under floating materials, only to swim off at great speed if disturbed. They also wrote of finding it in pools left after flooding of the river; these pools were said to reach temperatures considerably in excess

of those in the main body of water. They also described the retention of eggs and well-developed embryos but were unable to find evidence of live birth. Van and Pope said that 'lowa-lowa lice' was the Creole name for the fish whilst the Europeans termed it the 'sword-finned minnow', presumably because of the conspicuous gonopodium.

I can find no further reference to *Tomeurus* until 1955 when Myron Gordon wrote of his experiences with them; that is not to say references may not exist, just that as only an amateur aquarist my time and literature must need be limited. Myron Gordon's stock, which consisted of just one pair of living fish given to him by Axelrod, came from a South American shipment to World Wide Aquarium Supply Company of New York. In addition World Wide had the foresight to freeze a number of dead specimens to enable Myron Gordon to examine specimens without having to sacrifice the living ones. Reference to the report by Van and Pope led him to set up a tank for the *Tomeurus* with aged water to which salt was added; contrary to his normal meticulous reporting Myron Gordon tells us the depth of water, 4 inches, and the amount of salt added to the tank, but not the volume of water in the tank. Neither is any reference made to the adult size the fish can reach. Looking at my own specimens, the largest of which is 25 mm, I would hazard a guess that the maximum size would be no more than 35 mm.

Gordon handed his fish to Donn Rosen because of his experience with livebearers. Rosen noted that fertilisation took place soon after dusk; during daylight the female repulsed the male's advances by constantly facing him as he circled her attempting to mate. Spermatophores were recorded attached to the female's anal although whether these were poor misses or the result of actual mating does not appear clear. I am not sure whether it is known whether internal fertilisation actually takes place or whether the spermatophores are simply placed as near the genital opening as possible. The eggs, according to the reports, are laid singly at the rate of one a day and attached by adhesive filaments to suitable plants. The female avoids her mate, arches her back into an S shape and deposits the egg at the chosen site. The eggs take somewhere around 4 weeks to hatch, although Gordon in his article does not actually record a hatching.

My own two pairs of *Tomeurus* are at present in an 18 in. by 6 in. by 8 in. silicone-sealed all-glass tank containing aged rainwater to which a teaspoon of pure salt was added. The dealer is reputed to use base exchange softened water acidified on occasion with sodium hydrogen phosphate, but whether the *Tomeurus* were in such water is not known. Knowing that they come from estuary conditions,

acid water obviously is not their ideal.

My largest specimen, the male that died, was examined under a microscope because of its small size. The fish measured 25 mm from snout to caudal peduncle but only 4 mm at its greatest body depth. The dorsal fin had rotted completely away but from the indentation in the back it must have been less than 4 mm at its base; it is set well back and is similar in shape on the live fish to a female fighting fish's dorsal. The pectorals had eight rays, and the tail 18, all of which appeared to be soft. Approximately beneath the trailing edge of the operculum there was a pair of fins that consisted each of only one short curved spiny ray. Behind these came the characteristic gonopodium; unfortunately the curved extension of three rays, which gives the impression of a basket, had rotted but the remaining fin measured 7 mm and appeared to be composed of 33 segments. Behind the gonopodium was another unpaired fin, which reminded me of a long adipose; it contained 12 triangular spines which had a slight curve towards the tail. The operculum appeared to have an extension from the usual curved shape, reminding me of *Lepomis megalotis*, although I do wonder now whether I was seeing some internal structure. Live females have in place of the gonopodium a fan-shaped fin.

Now, I have carefully avoided naming the fins on the underside for if the pair of fins beneath the operculum are the ventrals then the fish has two anals, or, if they are only spines then the gonopodium is formed from one or both the ventrals and the female sports only one ventral.

The body is reminiscent of an eel in that the internal organs appear crowded up close to the head. It is transparent and devoid of colour except that the sac containing the internal organs shows an iridescent blue under the right side-light conditions; under top light it is simply a transparent fish. The swim bladder is easily seen, being approximately oval in the female's swimbladder; the male's is much longer and of a similar length to the gonopodium, presumably in order to balance the extra weight of this organ. The mouth is turned up and appears to belong to a carnivorous fish rather than a vegetarian one; it is larger than one would expect for so small a fish. They have been shown to take daphnia, artemia and some dry food.

Naturally I hope to get the *Tomeurus* to breed and if I am successful, and do not kill off my specimens, I shall try and let readers know how I fare.

Tomeurus gracilis poses many questions; is it a precursor of the livebearers, is it a livebearer that has gone back to egg-laying, or is it as Myers suggested unrelated to the Poeciliidae? If the latter is the case, living as it does in the wide waters of

the Essequibo where shedding of eggs and milt would possibly result in only a small proportion of fertile eggs, perhaps it has evolved its gonopodium independently as a method of insuring that each and every egg is fertilised.

Whatever the relationship of this fish to the

common livebearers it certainly is an odd one about which many facts are still unknown. It is a worthy addition to a collection of unusual fishes. The best common name to apply to it is, in my opinion, that which Myron Gordon coined—'little Tom'.

MARINIST'S Notebook

By ROY PINKS

ONE of the first questions I asked before I took up tropical marines was whether routine maintenance of the tank was comparable with that of a freshwater aquarium of similar dimensions. The answers I received were not particularly helpful, ranging as they did from 'Much less' to a degree of dedication bordering on fanaticism, a notion which I must admit jolted me considerably without actually deterring me from my lunatic path. I asked the question because cleaning and scraping and water changing, to say nothing of messing around with all the gadgets that this operation inevitably entails, are activities which bore me to tears. I suspect that it is this dreary business which puts off the partially dedicated fishkeeper finally and irrevocably, and it is for this reason that I always welcome new or improved methods of keeping aquaria looking well. After all, in these circumstances we have all that much more time for studying our fish, doing our planting and improving décor—so much more satisfying and relaxing ways of passing our leisure time.

I am an avid reader of the 'For Sale' columns in the local newspaper, and one can judge to some extent how the hobby is faring from the number and nature of aquaria up for sale over a given period. I wonder whether the trade would agree with me that 1973, judged on this basis, has been a better year than 1972? At any rate, that is my conclusion based on these quite unreliable criteria, and it would be interesting to know whether it is true or not. What is particularly noteworthy is that during the past 2 years I have read only one advertisement for a tropical marine aquarium; allowing for inadequate information in a number of other advertisements, it nonetheless seems that the quantity of these actually changing hands is very considerably lower than is the case with freshwater set-ups. Of course, there are fewer of them about, to start with, but they are supposed to be all that more difficult, and hence the failure (and therefore, turnover) rate might be expected to be quite high.

This inclines me to think that, perhaps after

all, the marine aquarium is not quite the maintenance liability it is often said to be, and it might also be concluded that, despite the high risk rate of the animals themselves, marine aquarists somehow persist beyond the normal limits in their efforts to keep things going. My experiences in this connection have been fairly consistent with this pattern, though I must confess that in the first 6 months of my marine venture it did seem at times that there was some very nasty and insuperable mystery behind it all which would keep coming back to defeat me just at times when things seemed to be going right. After some 2 years of varying fortunes I have adjusted tank maintenance to the same intervals as those applying to my freshwater aquaria. In general, the marine tanks look better than the others, partly because the contents are more striking (quite apart from the fish), and the undergravel filters leave the tank floors free of that mat of accumulated debris which I have to siphon from all the freshwater tanks every few weeks. A further factor which assists is that I never overfeed my marines, hence there is never any surplus food to remove because they gobble up everything I offer them. Another slight bonus in the case of marine aquaria is that algae are usually left to proliferate (other than on the viewing panel), and there is not the worry of having to remove algal growths from the surface of aquatic plants.

Thus, even with the fairly primitive equipment I have employed with my marine aquaria, no obvious problems have so far cropped up in terms of routine maintenance. A matter which may give concern sooner or later is the water quality, and there are certain signs that are giving me food for thought here. I shall continue to watch them and will record my findings in due course. I have so far worked on the assumption that most marinists will want to know how far one can go without water replenishment (i.e., changes, as opposed to topping up), but readers will probably have their own views about this, anyway. It would be nice to know if there really is a lazy way, after all!

COMMUNICATION IN THE FISH WORLD

Signals by Fins, Colours and Sounds

By IAN C. SELLICK

Photographs by the author

ALL the commonly recognised types of fish communication other than those of chemical communication, discussed in last month's article, can be grouped under the heading physical communication. These in general are those which the aquarist notices, such as direct visual communication, i.e. colour change, fin signals. Also in this section are included such phenomena as electrical stimuli, 'pressure-wave' communication and sound.

Visual signals are transmitted, often without the sender realising his role, by the use of colour patterns which can be changed to suit a particular situation, or by movements of the fins—licking the tail, or raising the dorsal fin, for example. Or, quite commonly, a combination of both of these is used.

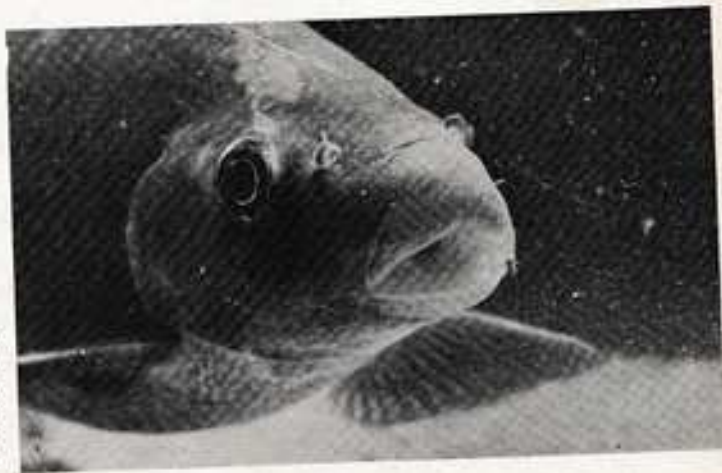
Coloration of fishes and its function was more fully discussed in my articles in the August and September issues of *PFM*, so only a summary will be given here. Coloration is a product of the skin of a fish and may be either chemical or physical. The latter tends to produce permanent patterns, which have less significance in signalling, although they may be modified by the former, chemical

colours. These chemical colours are produced by pigment-containing cells called chromatophores, which have the ability to expand or contract, thus darkening or lightening the colour of the skin. The predominant pigment in these granules is melanin, which may be black, brown or yellow, and its cells, melanophores, are responsible for much of the colour signalling that occurs in fishes.

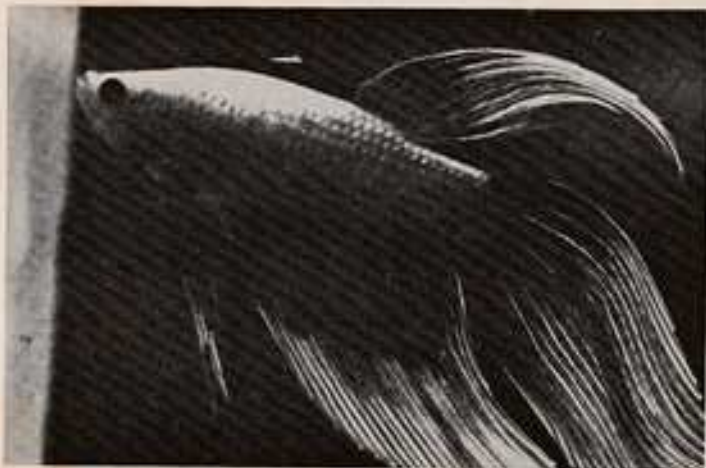
Colour Signals

In some species, notably cichlids, this colour signalling has evolved to an amazing complexity, with dozens of 'messages' present in the fish's vocabulary. For instance, in *Hemichromis fasciatus*, there are separate colour messages for:

- (1) 'I am going quietly about my business.'
- (2) 'I am prepared to defend my territory.'
- (3) 'I am prepared to defend my territory, by force if necessary.'
- (4) 'I am frightened and taking shelter.'
- (5) 'I am frightened and have nowhere to hide.'
- (6) 'I am guarding my young and will not tolerate interference.'
- (7) 'I am busy spawning.'



The mouth of a fish can be used as a means of communication: the opened mouth of the variegated shark (*Labeo variegatus*) signals aggression, the degree of mouth opening being indicative of 'temper'.



Sex-related length and development of finnage as in the Siamese fighting fish (*Betta splendens*), which also shows colour distinction of the sexes, can be exploited by aquarists to produce fancy varieties

All the above messages are conveyed solely by the use of red and black pigments in the skin. The chromatophores, which are under nervous or hormonal control, are able to contract extremely rapidly, and a change in signal can occur within a minute in many species, the speed varying from species to species.

In any fish, the most important piece of information that needs to be communicated is the sex of any particular individual. This is commonly shown by the colour pattern of the fish, which may only appear at the time of spawning—e.g., the beautiful red colour of the male stickleback (*Gasterosteus aculeatus*). In some fish this colour is present continuously unless the fish is frightened or is making some other signal. A permanent difference between male and female is called sexual dimorphism. *Pseudotropheus auratus* is the most familiar example of this, where the male is black with whitish stripes, the female yellow with black stripes. However, difference in colour is not the only form of sexual dimorphism—fins and body form may also be completely different.

Fins used for signalling have as many uses as colour patterns—and are used for sexual differentiation, threatening postures, and signs of defeat after battle. In many fish species there is a tendency for the fins, particularly the dorsal and anal, to become elongated in the male. Such a condition is found in many tetras, e.g. *Hyphessobrycon ranuncus*, *H. rubrostigma* etc., and in the cichlids, e.g. *Cichlasoma nigrofasciatum* (convict). In dwarf cichlids other fin variations occur—for instance, in the ram (*Apistogramma ramirezi*) the second spine in the dorsal of the male tends to be longer than that of the female—this together with beha-

vioural and colour patterns will indicate sex. In *Apistogramma agassizi*, not only the dorsal fin is elongated; so is the caudal fin, which is drawn to a point. On top of these fin shape differences, the male has orange fins and a bluish body with a white striped caudal fin; the female being a greyish brown. Another fish with a modified caudal is the sword-tail (*Xiphophorus kelleri*), where the bottom rays of the tail are vastly elongated. This tail is also used for 'showing off' and for ritualised fights with other males.

The tendency for males to have long colourful fins has been used to the aquarist's advantage to produce such fishes as the male Siamese fighter (*Betta splendens*), the fancy guppy and other fancy livebearing toothcarps.

So much for fin shapes, but the positioning and movements of the fin are equally important for communication. Like the peacock, many fishes when courting a female will spread their fins and swim round the proposed mate. The fins often have special colours and patterns designed to attract the female when the fins are spread. Apart from attracting females, this spread fin display may also be used in combat with other males—often the two fish swim side by side with fins spread and colours intense, e.g. *Tilapia mossambica*, many tetras and barbs. This display is all the more impressive if the fins have been elongated. This type of display tends to predominate in territorial fishes where the male picks a territory and is prepared to defend it by fighting, e.g. cichlids, some catfish and loaches and many marine fishes such as damselfishes and butterflyfishes.

In many fishes the fins are also used to signal defeat after a skirmish; e.g., *Tilapia mossambica*

Male black phantom tetra (*Megalomphodus megalopterus*) showing flowing extensions to both dorsal and anal fins signalling sex. These fins are spread in display to both females and rival males



after defeat tends to hang its caudal at some 20° below horizontal and fold the rest of its fins and lose its colour. Many fishes will fold their fins if defeated by a larger fish; and do so also if diseased, cold or just plain scared—aquarists should take note of this communication!

Often a fish will quickly shake its fins, or 'shimmy', e.g., discus (*Symphysodon equifasciata*) and other cichlids, particularly during courting or skirmishes—however, it is in all probability not the movement that is noticed by the other fish, rather the rapid changes in local water pressure as detected by the lateral line receptors. This aspect will be discussed later.

Visual signals are used to a great extent in defence, in other ways than spreading the fins as mentioned above. In some species, such as the firemouth (*Cichlasoma meeki*), the opercular flaps are extensible and have eye spots on their posterior edges, so that on attack the defending fish undergoes the following manoeuvres:

- (1) Turns to face attacker.
- (2) Spreads opercula.
- (3) Drops floor of mouth.
- (4) Intensifies colour of throat and eye spot on opercula.
- (5) True eyes become obscured by a dark band.

This action suddenly presents to the attacker what appears to be a much larger fish and it will often flee in confusion. This frontal defence is seen most commonly in the cichlids, although most fishes will spread their gills on attack—the opercula are bony and provide a good physical defence.

In addition to frontal defence, there may be a

similar lateral defence where the dorsal fin has an eye spot and is spread on attack. This confuses the attacker, especially if the true eye is obscured by a dark line. This defence is particularly common in the marine genus *Chaetodon*.

Usually all combat between fish of similar species is resolved by the above displays before any real damage is done; fighting thus becomes a highly ritualised performance with certain steps conveying certain messages. In these ritualised fights, the position of the body may be as important as fin position or colour patterns—for instance, submission in *Tilapia macrochir* consists of lying partly on the side, head slightly up.

The mouth is also used as an organ of communication—again particularly during skirmishes. In the American bullhead *Ameiurus natalis* the mouth display varies in intensity from almost completely closed non-aggression to gaping aggression. In the kissing gourami *Helostoma temminckii* the act of kissing may possibly have some communicatory significance, although, as both adults and young kiss each other and inanimate objects indiscriminately, its value is difficult to see.

In the sea, possibly the most important 'mouthed' communication is that between a large fish and the cleaner wrasse, *Labroides dimidiatus*, or *Elacatinus oceanops*. Here the situation is unusual in that one species signals to a completely unrelated fish and also in that most fishes that come to be cleaned use the same signal, namely that of opening the mouth wide and sometimes spreading the fins so that the cleaner may perform its duties. Many cleaners set up 'shop' in a particular part of their habitat and summon a fish to come and be cleaned by dancing up and down in front of it—wriggling the body—the dance being less vigorous the more

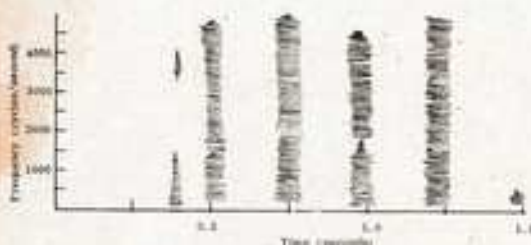
familiar the customer. During cleaning, the wrasse will fan its ventral fins continuously to let the host feel where it is. The host, when it has had enough, will pretend to close its mouth, flick its gills and shake the body.

Contact by Touch

It is indeed a rare event when two fish touch each other, this usually only occurring if, for instance, the ritualised fighting previously described has broken down and an actual fight occurs. However, this is not communication. In most fish where touch is an important means of communication, it is only the young which use it. For instance, the young mouthbrooding species, particularly *Tilapia*, will peck at the gill covers of the mother when they want to take shelter in her mouth. Another cichlid where the young pecks at the parents is the discus (*Symphyzodon* spp.) when

heard if a submersible microphone is lowered into the water, particularly when feeding—listen to an angel eating flake off the surface! However, not all of this noise is communicatory, although other fish of the same or similar species may recognise the toothy clicks associated with feeding and be attracted to the source of food. Other incidental sounds may be made as the fish swims or collides with something. Our main concern here though is with consciously produced sounds.

All noise-producing organs in fishes are of the drum type, the swimbladder in most cases being used as the resonant organ, the noise being produced by special drum muscles attached to the outside and making the bladder vibrate when they contract. Occasionally, strands of tissue are stretched inside the bladder to alter its resonance. In some fishes the bladder is directly connected to the inner ear and in others, e.g. cyprinodonts, minute bones join the swimbladder and inner ear. Thus



Diagrammatic spectrogram (duration and frequency) of typical sounds made by the angel fish (*Pteraphyllum* sp.) during aggressive action.

they peck at the secreted food; the parents respond to the pecking by continuing production—removal of the youngsters would see a reduction in the amount of food being produced. When the parents are temporarily exhausted, they shake their bodies and flick the young on to the other parent.

Among adult fishes, touch may be important during courtship of such as catfish that have poor eyesight. For instance, during the communal spawning of *Corydoras* species, the males will run their whiskers over the head of the females, indicating his readiness to spawn. In species of cichlid where a genital tassel is present, such as *Tilapia variabilis* and *Ophthalmochromis ventralis*, touch and mouthing of these by the female may cause ejaculation by the male, the female thus picking up sperm in the mouth and thus ensuring complete fertilisation of the eggs previously picked up.

Sound Communication

This is the first of the sections covering aspects of communication that may not be noticed by the aquarist. Fish are surprisingly noisy, as can be

the bladder can both send and receive sound signals. In types with small bones, high frequency signals are sent of between 85 and 11,000 cycles/second (Hz). In most noise-producing fishes, however, a narrower frequency range is found from about 100 to 600 Hz. Angel fish form an exception—they have a component at 8,800 Hz.

Marine fishes have been the most extensively studied, and a vast catalogue of sounds is available to help in underwater fish identification. These sounds have various functions and tend to be more important in fishes that live in darkness, such as the deep sea fishes, or bottom-dwellers where the water is murky and vision difficult.

Among aquarium fishes, it is the cichlids that have been the most intensively studied, and the following sounds have been found:

- (1) A 'thump' type by such as *Hemichromis bimaculatus* associated with the frontal defence pattern.
- (2) A 'moan' type by *Cichlasoma nigrofasciatum* females while guarding eggs to warn the male to keep away.
- (3) A series of wide frequency clicks by angel fish in aggressive situations, or when guarding eggs or young fish.

Many more types of sound have been recognised in marine fishes and recorded, although their significance is often obscure. However, noises tend to be produced in aggressive situations, usually to frighten away a predator—although if this species is 'deaf' (unlikely) then this deterrent may not work, although the lateral line receptors can usually pick up these sounds, if of sufficiently low frequency.

The most important use of sound is certainly between a couple during courtship and spawning; for instance, in the seahorse (*Hippocampus*), loud clicks coincident with sharp upward flexion of the

head and rapid movements of the mouthparts, are produced during the preliminaries to copulation, alternately by the two fishes. During the actual embrace, loud and almost continuous clicks may be heard.

As in most aspects of fish communication, much work still needs doing in the field of underwater bioacoustics, although with remote control TV cameras and microphones it is possible to observe the fishes indirectly and listen to the sounds they make without unduly disturbing them.

(To be continued)

In the Eyes of the Beholders



Some of the FBAS Judges at this year's AQUARIUM SHOW came under the scrutiny of the lens of CLIFF HARRISON



Top left: Mr A. M. Deakin; top right: Mr Maurice Carter; lower left: Mr D. Durrant; lower right: Mr H. Towell

Readers' Queries Answered

Fry Feeding

I have just lost most of a spawning of White Cloud Mountain minnows and am very disappointed about this as it was my first effort with egglayers. A friend has said that it might have been because the fry tank was not lit. Is this correct? And if so, why does the light make so much difference?

Correctly feeding egglayer fry during the first week or two of life is one of the most important factors in their successful rearing. They must receive plenty of appropriately sized food, preferably where they can obtain it easily without having to travel great distances to find a small amount of nourishment. With a light bulb illuminating the tank, the fry will be attracted by the light and gather around it; the food can then be dropped in this one spot. If Infusoria are being given, these, too, will be attracted by the light and will remain in the same vicinity as the fry. It is also easier under these circumstances to spot any turbidity in the water (which would indicate that some of the water should be replaced with fresh).

It is in connection with the correct feeding of the fry that most dangers arise in these early stages. Mountain minnow fry should be given Infusoria for the first week, but they must receive it in small, frequent, doses. At the same time it is necessary to keep a careful watch that no water pollution is occurring and if the water shows any sign of cloudiness some of the old water must be replaced by fresh (siphoning must be done through a fine net or fry may be lost).

Worms Galore

I would really like to be able to supply my fish with garden worms regularly and I spend some time looking for them each day. But the 'bag' is often very small. There are a few special stores I turn over to find them but short of digging the garden up, it seems rather a hit-and-miss way of doing it.

A garden compost heap should

keep you supplied with plenty of worms and what's more they'll be nice and clean and 'juicy' looking. Build the compost heap over a



THE success of the Invitation Show held by SLOUGH & DAS, that attracted nearly 200 entries from High Wycombe (HW), Hounslow (H), Bracknell (B), Roehampton (Ro), Riverside (R), Rannymede (Ru) and Ealing(E) Societies means that a similar event will almost certainly be held next year. Judges Mr H. Towell, Mr M. Carter and Mrs P. Hayton made the following awards:

B: 1, Mr R. Leslie (HW); 2, Mr K. South (Ro); 3, Mrs D. Cruickshank (E).
C: 1, Mr K. Goodson (Ro); 2, Mr R. Cox (HW); 3, Mr L. Little (Ro).
D: 1, Mr T. Hall (HW); 2, Mr J. Burt (E); 3, Mr J. Sheppard (Ro).
E: 1, Mrs Parrish (E); 2, Mr L. Little; 3, Mrs Sutford (Ro).
G: 1, Mr D. Lambourne (Ro); 2, Mrs P. Lambourne (Ro); 3, Mrs M. Netherell (Ro).
H: 1, Mr J. Shepherd; 2, Mrs Parrish; 3, Mr J. Burt. **N:** 1, Mrs M. Netherell; 2, Mr E. Pook (H); 3, Mr R. Leslie. **OP:** 1, Mr L. Little; 2, Mr T. King (Ro); 3, Mrs M. Netherell. **QR:** 1 & 2, Mr J. Paine; 3, Mr L. Little. **S:** 1, Mrs D. Cruickshank; 2 & 3, Mr D. Lyne (HW). **T:** 1, Mrs D. Cruickshank; 2 & 3, Mr A. South (H). **X:** 1, Mr J. Stubbly (Ro); 2, Mr L. Little; 3, Mr D. Lyne.

Mrs D. Cruickshank of Ealing won the Phisn Trophy for 202 livebearers. The Kei Ang trophy for best fish in show was won by the *Chrysipteryx ornatif* owned by Mr D. Lambourne, the Young trophy for the highest placed Slough member by Mr K. Ferris and the Knight trophy for best club by High Wycombe.

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patch of earth and raise it with rotting leaves and grass cuttings mixed with earth. Potato peelings and tea leaves can also be added to the pile. A piece of sacking or an old bristle mat placed over a section of earth and kept wet should also entice a quota of worms to accumulate on their undersides.

BASINGSTOKE AS were the Society accumulating the most points at the THREE COUNTIES GROUP Open Show, and Mr L. J. Brazier of Sudbury AS the competitor with the highest number of points. Reading & DAS won the Society group entry, with High Wycombe coming second. The best fish in the show was entered by Mr R. Leslie of High Wycombe. Other results were:

A: 1, Mr T. Duffy (Bracknell); 2, Mrs R. L. Jackson (Basingstoke); 3, Mr P. Rasthrook (Reading). **B:** 1, Mr D. B. Stubbly (Aldershot); 2, Mr A. Marshall (Bas); 3, Mr K. Burt (Gosport). **Ba:** 1, Mr R. Leslie (H.W.); 2, Mr L. Little (Bracknell); 3, Mr T. Taylor (UNATT). **Ca:** 1, Mr B. Hanson (Bas.); 2, Mr T. Wynn (Southampton); 3, Mr J. H. Jackson (Bas.). **Ca:** 1, Mr J. Heston (Leicesters); 2, Mr M. Leslie (Bracknell); 3, Mr R. Hanson. **Da:** 1, Mr T. Taylor; 2, Mr G. B. Dixon (Newbury); 3, Mr L. J. Brazier (Sudbury). **Dh:** 1, Mr M. D. Chapman (UNATT); 2, Mr K. Hanson (Bas.); 3, Mr B. Hanson. **Ds:** 1, Mr R. Burt (Gosport); 2, Mr D. Lyne (H.W.); 3, Mr G. E. Dixon. **Da:** 1, Mr P. Brown (Simpson); 2, Mr J. Connolly (Berkhamstead); 3, Mr A. Hall (H.W.).

Ea: 1, Mr P. J. Shepherd (Reading); 2, Mr A. P. Taylor (Sudbury); 3, Mr J. Taylor. **Ec:** 1, Mr A. P. Taylor; 2, Miss J. Goodard (Sudbury); 3, Mr J. H. Jackson. **F:** 1, Mr A. Gibson (Reading); 2, Mr L. J. Hanson; 3, Mr M. E. Cox (Gosport). **G:** 1, Mr L. J. Brazier; 2, Mr P. Merritt (Reading); 3, Mr B. Hanson. **H:** 1, Mr P. Moye (Sudbury); 2, Mr P. Rasthrook; 3, Mr T. Duffy. **J:** 1, Mr M. Carter (Bracknell); 2, Mr A. Harmanworth (Bas.); 3, Mr T. Taylor. **K:** 1, Mr T. Taylor; 2, Mr J. Bady (Sudbury); 3, Mr M. Carter. **L:** 1 & 2, Mr M. Carter; 3, Mr T. A. Cruickshank (Ealing). **M:** 1, Mr A. P. Taylor; 2 & 3, Mr P. Merritt (Reading). **N:** 1, Mr G. E. Dixon; 2 & 3, Mr L. J. Brazier. **No:** 1, Mr M. Strange (Bas.); 2, Mr R. A. Holmes (Basingstoke); 3, Mr M. J. Lewis (Sudbury). **O:** 1, Mr T. A. Cruickshank; 2, Mr C. W. Goodard (Sudbury); 3, Mr A. Wynn (Duloch). **P:** 1, Mr A. Wynn; 2, Mr L. J. Brazier; 3, Mr P. Merritt. **Q:** 1, Mr J. Paine (H.W.); 2, Mr P. Ronald (UNATT); 3, Mr L. Turner. **R:** 1, Mr M. E. Cox; 2, Mr M. D. Chapman; 3, Mr L. Little. **S:** 1, Mr B. Turner (Bas.); 2, Mr D. Lyne; 3, Mr M. D. Chapman. **T:** 1, Mr M. Strange; 2, Mr A. Heston (Leicesters); 3, Mr K. Hanson.

U: 1, Mr F. Pinder (UNATT); 2 & 3, Mr W. C. Cowley (Gosport). **Ua:** 1 & 2, Mr C. Berris (H.W.); 3, Mr L. Lambourne (New Forest). **V:** 1, 2 & 3, Rasthrook & Green (Reading). **W:** 1, Mr M. Little. **Wa:** 1, Mr A. Heath (Leicesters); 2 & 3, Mr F. Pinder (UNATT). **Xb:** 1, Mr D. Lyne; 2, Mr G. E. Dixon; 3, Mr B. Pook (Hounslow). **Xo:** 1, Mr R. Oslow (Bas.); 2, Mr E. A. Holmes (Sudbury); 3, Mr L. Little. **Z:** 1, 2 & 3, Mr T. Duffy (Bracknell).

Harlow Aquarium Supplies Win PFM Shield for Best Retailers' Furnished Aquarium

The furnished aquarium entered by Harlow Aquarium Supplies was judged winner by ballot of the Retailers' Furnished Aquarium Competition at The Aquarium Show last month. The 36 inch aquarium, with half-black guppies making the fish content, is shown below. Mr Mike Williams is pictured (right) being presented with the PFM Shield by Mr Frank Tomkins, chairman of the FBAS



AN idea from the editor of the COVENTRY POOL & AQUARIUM SOCIETY Newsletter to combat the possible trials of the coming winter. If power cuts occur, he writes: 'For filtration and aeration small battery-operated pumps can be used, or another method is to inflate a Lilo, connect this to the filter or airtank and put some pressure on the Lilo to expel the air into the tank. I was wondering if it would be possible to drive the piston type of pump by using a Meccano steam engine or electric motor. . . . If anyone has any other ideas for emergency procedure they would be most welcome.'

Meetings and Changes of Officers

ABERDEEN AS. New Secretary: Mr Andy Imbach (61a Dee Valley Caravan, Drumoak, Aberdeen).

BLACKBURN AQUARISTS WATERLIFE SOCIETY. New Secretary: Mr P. J. Whelan (160 Dunson Drive, Blackburn, Lancs).

BLAKEBOROUGH AS. Change of address. Secretary: Mr T. Ricker (45-47 Canon Street, Blakesborough, Yorks YO5 1UE).

BRITISH MARINE AQUARISTS' ASSOCIATION, LONDON & SOUTH-EASTERN GROUP. Secretary: Mr B. Wilkinson; assistant: Mr P. Ireland (15 Weyland Road, Welham Green, London, E4 8FD); P.R.O.: Mr G. Cox; treasurer: Mr D. Hiammetts; projects officer: Mr A. Hendrick.

BURY & DAS. Chairman: Mr Ian Wood; secretary: Mr B. Hatten (1st Welling Street,

Bury: 061-774 2104); show secretary: Mr R. Buckley.

CARDIFF AS. New venue: The Trefegar, Clifton Street, Cardiff on the 1st Thursday of each month at 8 p.m.

DORCHESTER & DAS. Chairman: Mr H. Corrick; vice-chairman: Mr A. Billington; secretary: Mrs B. Jeffries; treasurer: Mrs L. Norman.

GLOUCESTER AS. New Secretary: Mr B. Willey (41 Holbe Road, Gloucester, GL4 7BE).

MID-SUSSEX AS. New Secretary: Mr Ken Green (1 Balmorie Court, Horsham, Sussex).

ROMFORD & BEACONSFIELD AS. Chairman: Mr D. Kent; secretary: Mr Albert Waknell (143 Bruce Avenue, Hornchurch, Essex); treasurer: Mr F. Victory; show secretary: Mr E. Jenkins (21a Southend Arsenal Road, Hornchurch).

SWILLINGTON AS. President: Mr B. Hullo; vice-president: Mr D. Stodd; treasurer: Mr R. Stanger; secretary: Mr J. Abbott (128 Broadway, Hornchurch, Lond); show secretary: Mr C. Townsend; social secretary: Mrs A. Hildop.

THANET AS. Change of venue: The Britanno Inn, Margate, Kent, 1st Tuesday of month. Chairman: Mr P. Lovings; secretary: Mr B. Stowell; show secretary: Mr M. Sell; treasurer: Mrs V. Rook (23 Dune Park Road, Ramsgate, Kent).

WEDNESBURY & DAS. President: Mr E. Skidmore; chairman: Mr B. Coley; secretary: Mr B. Law; treasurer: Mr B. Hughes; show secretary: Mr J. Reeves (1st Peter Street, Hill Top, West Bromwich, Staffs, B70 6BT); assistant: Mr B. Dawes. Meetings: 1st Monday in month, 8 p.m., Midland Vaults, The Lamp, Upper High Street, Wednesbury, Staffs.

WREXHAM YES. Chairman: Mr T. Poul; vice-chairman: Mr B. Mather; treasurer: Mrs V. Oliver; secretary: Mr E. Jones (1 Parkfield, Greatford Park, Greatford, nr. Wrexham); treasurer: Mr B. Roberts; show secretary: Mr G. Pritchard.

YEovil & DAS. New Secretary: Mr P. New (8 Mayfield Road, Yeovil, Somerset).

British Aquarists' Festival

ENTRIES from winners of Best in Show awards made a total of 44 entries in the Champion of Champions Contest at this year's **BRITISH AQUARISTS' FESTIVAL** at Belle Vue, Manchester. The *Tilapia melanopleura* entered by Mr L. B. Booker from Morecambe Bay AS won the contest (2, Mr & Mrs Shipman with a *Danio rerio* microlepis, Grantham & DAS; 3, Mr G. B. Cooper (C. severum, Peterlee AS). This 22nd Festival proved a great success with the very keen group who travelled down from Edinburgh returning home crowned with success after winning first place (and the £50 prize money) in the Society Stand competition (2, Bary & DAS; 3, Lanarkshire; 4, Village). Mr S. Heap of Belle Vue won the award for best fish in show and the Wathy Grove Press trophy for best tropical fish. Mr W. H. Ramsden of the NGPS won the Belle Vue Silver Challenge trophy for best coldwater fish. Best tropical egglayer went to Mr P. Bowden of Stretford; best tropical livebearer to Mr B. W. Carter of Merseyside. The Northern Goldfish & Pondkeepers Society were the Society with four highest pointed awards, and Mr W. H. Ramsden of that Society was the exhibitor with most awards (John East Memorial trophy). The exhibitor with most awards in the breeders section was Mr H. Christie of Lanarkshire.

Detailed awards were as follows:

Best Society furnished aquarium, tropical: 1, Halifax (H. Casson trophy); 2, FGA

(24); 3, Lanarkshire (SB). Coldwater: 1, Halifax (71); 2, NGPS (42); 3, Edinburgh (46). Individual furnished, tropical: 1, Mr D. Fryer (Halifax, 76, Walter South Commemorative shield); 2, Mr A. P. Vassiere (Merseyside, 74); 3, Mrs S. Glen (Bury, 69). Coldwater: 1, Mr D. L. Shoolish (Halifax, 68, The Hammers trophy); 2, Mr H. Poshall (Oxey, 66); 3, Mr A. Mills (Bury, 63, Aquascope); 4, Mr H. Poshall (23, Aquascope Cup); 5, Mr S. Seymour (Merseyside, 65); 6, Mr J. Thompson (Edinburgh, 64). Novelties: Aquarists: 1, Mr M. Strang (Basingstoke, 75, The Jay Kelly trophy); 2, Mr E. Seymour (Merseyside, 77); 3, Mr J. Broadley (Village, 74).

Common goldfish, contest: 1, Mr A. Young (Edinburgh, 78); 2, Mr W. H. Ramsden (NGPS, 77); 3, Mrs O. M. Matthews (NGPS, 74, Shafarukha); 4 & 5, Mr B. M. Rutwell (NGPS, 78, 75, 25GB trophy); 6, Mr H. Poshall (74); 7, Mrs Moore, single; 1 & 2, Mr W. H. Ramsden (79, 81, The Nottingham Shield); 3, Mr C. H. Whitty (Accrington, 80, Valhalla, single); 4 & 5, Mr W. H. Ramsden (84, 87, Walter South trophy); 6, Mr C. H. Whitty (81, see Fencing trophy); 7, Mr W. H. Ramsden (85, The Chester Shield); 8, Mr R. Rich (Basingstoke, 82); 9, Mr J. S. Hall (Aireborough, 82), see Coldwater; 10, Mr W. H. Ramsden (76, The Derby shield); 11, Mr S. Walsh (Accrington, 80); 12, Mr J. S. Hall (83).

as Guppy, single: 1 & 2, Mr H. Baldwin (FGA, 66, 64); 3, Mrs P. Young (FGA, 63, Guppy); 4, Mrs P. Glen (FGA, 66, Harrogate trophy); 5, Miss S. Clarke (Aireborough, 115); 6, Mr A. Christie (FGA, 60, Linsbore, single); 7, Mr B. W. Carter (Merseyside, 74); 8, Mr P. S. Hall (Aireborough, 73); 9, Mr P. Chisall (Glyde, 74); 10, Livebearer, pairs: 1, Mr A. Robinson (Oxley, 87, Fraser Brouse Cup); 2, Mr J. Hooley (Village, 86); 3, Mr & Mrs Turner (Sheaf Valley, 87); 4, Angela, single; 5, Mr G. Wilkinson (Hyde, 84); 6, M. & S. Turner (Glossop, 74); 7, Mr L. Leadbetter (Flewood, 74); 8, Angela, pairs: 1, Mr M. Wild (Accrington, 74, Wharfedale & Strikala Cup); 2 & 3, Mr J. Brown (Glyde, 84, 84), Cichlid, single: 1, Mr & Mrs Whitley (Aireborough, 84); 2, Mr P. Whelan (Barnsley, 76); 3, Mr H. Shanks (Peterlee, 78, Pair); 4, Mr B. Shanks (88, The Lancaster trophy); 5, Mr G. Brown (M. Pleasant, 67); 6, Mr G. Leadbetter (86), see Cichlid, single; 7, Mr E. Bowden (Stretford, 81); 8, B. & S. Wharton (Goosay, 18); 9, Mr P. Whelan (81), see Cichlid, pairs: 1, Mr

H. Baldwin (Peterlee, 86, The National Cup); 2, Mr G. Brown (Basingstoke, 72); 3, Mr P. Thorn (Village, 66), Eggs, single: 1, Mr W. Turner (Basingstoke, 74, The Ian Latta Cup); 2, Mr S. Clarke (Aireborough, 74); 3, Mr J. Thompson (Edinburgh, 71). Gouramis, av, single: 1 & 2, Miss S. Clarke (77, 80); Mr A. Elton (Blackburn, 75), av Gourami, pairs: 1, Mr B. Mery (Village, 66); 2, Mr Newsham (Blackpool, 64); 3, Mr Borer (Sheffield, 88), av Barb, single: 1, Mr J. Mery (Sheffield, 74); 2, Mr D. Stocks (Halifax, 74); 3, Mr D. Birchall (Aireborough, 69), av Barb, pairs: 1, Mr A. Blake (Basingstoke, 77, K. & P. Cup); 2, Mr B. Manshall (Blackburn, 73); 3, Mr B. Mery (Sheffield, 63), av Characin, single: 1, Mr P. Bowden (Stretford, 73); 2, Mr R. Rich (Basingstoke, 74); 3, Mr A. Jackson (Village, 74, av Characin, pairs); 4, Mr B. Brown (Basingstoke, 77, The East Lancs Cup); 5, Mr A. Wainwright (Basingstoke, 75); 6, Mr R. Bell (Edinburgh, 80, Carps & minnows, single: 1, Mr G. Brown (M. Pleasant, 79); 2, Mr A. Baldwin (Nelson, 77); 3, Mr S. Buckley (Bury, 74), Carps & minnows, pairs: 1, Mr A. Mann (Huddersfield, 73, The Warwick trophy); 2, Mr A. Buckley (71); 3, Mr A. Youngson (Lancashire, 65).

as Catfish, single: 1, Mr B. W. Carter (Merseyside, 77); 2, Mr E. Leadbetter (Flewood, 76); 3, Mr P. T. Richardson (Merseyside, 75), av Catfish, pairs: 1, Mr R. Davies (Belle Vue, 78, The York trophy); 2, Mr D. Jamieson (Lancashire, 74); 3, Mr J. Scott (Edinburgh, 73, Eggs, av gouramis, single: 1, Mr H. Manshall (BKA, 77); 2, Mr A. Bowley (Bury, 74); 3, Mr B. Farnsworth (BKA, 67), Pairs: 1, & 2, Mr Strang (BKA, 78, 77, 76, FNAS Cup); 3, av Loach, single: 1, Mr P. T. Richardson (Merseyside, 74, The Durham trophy); 2, Mr D. Trenchard (M. Pleasant, 76); 3, Mr D. Goggin (Accrington, 85, see single); 4, Mr S. Heap (Belle Vue, 81, Leeds Rose Bowl); 5, Mr J. S. Hall (74); 6, Mr P. Whelan (87).

Breeders: English: 1 & 2, Mr H. Christie (Lancashire, 86, 77, 80, Martin Aquaria trophy); 3, Mr S. Birley (Huddersfield, 64), Livebearers: 1, Mr E. Williams (Lancashire, 87, FNAB trophy); 2, Miss S. Clarke (82); 3, Mr R. Shanks (Peterlee, 86), Coldwater: 1, & 2, Mr W. H. Ramsden (78, 75, Edgar Chapman Memorial trophy); 3, Mr B. M. Rutwell (NGPS, 78), av Pairs: 1, Mr A. Bowley (Bury, 78, FNAB Cup); 2, Mr M. Ross (Lancashire, 71); 3, Mr D. Glen (Bury, 69, Martin furnished); 4, & 5, BMAA Cheshire & N. Wales Group (79, 84, 82, FNAB trophy), Marine fish, single: 1, Mr S. Wetherburne (Flewood, 78, R. Atherton Shield); 2, Mr P. Armstrong (Heywood, 73); 3, Mrs S. Glen (Bury, 66).

MR J. E. Whitley of Aireborough won the best tropical and best in show awards at the **WEST CUMBERLAND AC Open Show**, and Mr J. S. Hall of Aireborough the best coldwater award and those for the exhibitor gaining most points and for the best livebearer. Mr R. Strand was the best club member with most points. Details are:

Pairs: 1 & 2, Mr I. T. Powley (Borden); 3, Mr J. S. Hall, Swans; 4, Mr J. Parker (West C.); 5, Mr J. S. Hall; 6, Mr S. Clarke (York); 7, Mr J. S. Hall; 8, Mrs Hall; 9, Mr E. Leadbetter (Flewood); Guppies: 1, Mr S. Clarke; 2 & 3, Mr E. Leadbetter, see Livebearers; 4, Mr J. E. Whitley (Aireb.); 5 & 6, Mr R. Strand (West C.).

Dwarf cichlids: 1, Mr J. E. Whitley; 2, Mr E. Leadbetter; 3, L. & P. Graham (East Lancs.); 4, see Cichlid; 5, Mr R. Luckie (class winner); 6, Mr E. Leadbetter; 7, Mr B. Black (Flewood); Barb to 10 in.: 1, Mr B. Black (class winner); 2, Mr J. Hall (West C.); 3, Mr S. Clarke, see Barb; 4, Mr E. Leadbetter; 5, Mr S. Clarke; 6, Mr E. T. Powley, H. & H.; 7 & 8, Mr S. Clarke; 9, Mr M. Ball (West C.), Anotomas & see sp.; 1, Mr J. S. Hall (class winner); 2, Mr J. E. Whitley; 3, L. & P. Graham, see Characin over 2 in.; 1, Mr R. Strand; 2 & 3, Mr E. Hodgson (Borden), see Characin over 2 in.; 1, Mr E. Hodgson; 2, D. & R. Standen (East Lancs.); 3, Mr I. T. Powley.

Sharks & see sp.: 1, Mr I. T. Powley (best in section B); 2, Mr B. Woodward (West C.); 3, Mr W. Riddle (West C.), Seahorses: 1, Mr R. Strand; 2, Mr T. Hatley (Borden); 3, Mr J. E. Whitley; Dennis & minnows: 1, & 2, Mr R. Strand; Killar: 1, Mr J. E. Whitley; 2, Mr J. S. Hall; 3, Mr J. Collins (Borden). Loaches: 1, Mr S. Clarke (best in class & loach); 2, L. & P. Graham; 3, Mr

J. E. Whitley, Corydoras: 1, Mr B. Black; 2, Mr E. T. Powley; 3, D. & R. Standen, see Catfish; 4, Mr E. Leadbetter; 5, D. & R. Standen; 6, Mr E. Hodgson, Anabantids, small: 1, Mr S. Clarke; 2, Mr E. Hodgson; 3, Mr E. Leadbetter, see Anabantids; 4, Mr J. S. Hall (class winner); 5, Mr E. Carr (Godolphin); 6, Mr B. Bree (West C.), see Tropical; 7, Mr J. E. Whitley; 8, Mr J. Collins; 9, Mr J. S. Hall, Pairs, Livebearers: 1, Mr S. Clarke; 2, Mr J. S. Hall; 3, Mr E. Leadbetter, Egglayers: 1, Mr R. Luckie (class winner); 2, Mr E. Hodgson; 3, Mr E. Leadbetter, Breeders, Livebearers: 1 & 2, Mr E. Leadbetter (class winner); 3, Mr J. S. Hall (Borden); Egglayers: 1, Mr R. Strand; 2, Mr G. Scott (West C.); 3, Mr H. Mitchell (West C.).

Common goldfish: 1 & 2, Mr J. S. Hall; 3, Mr B. Mitchell (Flewood), Shubunkins: 1 & 2, Mr J. S. Hall; 3, Mr G. Brown (Borden), see Shubunkins; 4, 5, 6, 7, Mr J. S. Hall, see Twinstar; 1 & 2, Mr J. S. Hall, see Coldwater; 1 & 2, Mr P. Graham; 3, Mr J. S. Hall, Novelties, pairs: 1, Mrs Parker (West C.).

Hounslow A.S. Open Show

OVER 470 tropical and coldwater fishes were on view to the public at the Hounslow Youth Centre on the occasion of the Society's Open Show. Keen competitors travelled from many parts of England and Wales to enter their fish in the 30 classes available. One of the most admired classes was that for tropical catfish; some very fine specimens were on display and it was a tropical catfish that won the best fish in show award for owner Mr D. Lambourne of Roehampton, who is well known in aquarist circles for his fine collection of catfish and his skill in breeding these rather difficult species. The organiza-

tion of this very successful event was in the capable hands of show manager Mr E. Sheppard, FBAS judge was Mr H. Tynwell, Mr E. Nicoll, Mr M. Carter, Mr A. Blake, Mr R. Eason, Mr R. Ginger, Mr J. Jeffrey, Dr R. List and Mrs P. Baynton. Awards were presented by the Society's chairman, Mr R. Allam, to the following:

- Ag: 1, Mrs Jackson; Bt: 1, Mrs Caryl; 2, Miss Thomson; 3, Mr S. Mason; Bt: 1, Mr S. Mason; 2 & 3, Mr R. Lawler; Cg: 1, Mr D. Bopps; 2, Miss Cople; 3, Mr M. Strang; Cg: 1, Mr A. Bagby; 2, Mrs Caryl; 3, Mr C. Moore; Dk: 1, 2 & 3, Mr S. Hanson; Dk: 1, Mr J. Batts; 2, Mr D. Hain; 3, Mr R. Ross; Ee: 1, Mr R. Baines; 2, Mr L. McQuade; 3, Mr A. Hall; Ee: 1, Mr & Mrs Farrin; 2, Mrs Caryl; 3, Mr A. P. Taylor; Fc: 1,

- Mr M. Collins; 2, Mr M. Alexander; 3, Mr D. Brooks; Fc: 1, Mr R. Usher; 2, Mr J. Clark; 3, Mr A. Constantine; G: 1, Mr D. Lambourne; 2, Mr J. Clark; 3, Mr A. Constantine; H: 1 & 2, Mr J. Batts; 3, Mr J. M. Sheppard; J: 1, Mr S. Mason; 2, Mr J. Stollery; 3, Mr C. White; K: 1 & 2, Mr R. Poole; 3, Mr T. Taylor; L: 1, Mr R. Lashley; 2, Mr A. P. Taylor; 3, Mr D. Kelly; Nk: 1, Mr R. Lashley; 2 & 3, Mr J. Clark; O: 1, Mr S. M. Bailey; 2, Mr A. P. Taylor; 3, Mr T. Foley; P: 1, Mrs S. Carridge; 2, Mr A. Hall; 3, Mr S. Fournelle; Q: 1, Mr L. B. Pierce; 2, Mr R. Usher; 3, Mr M. Chapman; R: 1, Mr M. Chapman; 2, Mr M. Cox; 3, Mr C. Turner; S: 1, Mr M. Dase; 2, Mr A. Constantine; 3, Mr B. Turner; T: 1, Mr V. E. Vallejo; 2, Mr R. Usher; 3, Mr E. C. Farthing; U: 1, Mr E. Pender; 2, Mr R. Usher; 3, Mr E. C. Farthing; U: 2, 3 & 4, Mr J. Graham; 2, Mrs Lockstaff; V: 1, B & 3, Mrs Langstaff; 2, Mrs Pender; W: 1, Mrs Langstaff; 2, Mr A. Heath; 3, Mr G. Morris; Xb: 1, Mr D. Lyle; 2 & 3, Mr R. Poole; Xc: 1, 2 & 3, Mr R. Usher; 3, Mr A. J. Smith; Special class: 1, Mr D. Lambourne; 2, Mr R. Baines; 3, Mr R. Lashley. Hounslow won the Interclub Shield with 42 points.

A RECORD amount of fancy goldfish was given for auction by auctioneer Mr R. Dodkins at the 25th Anniversary Show of the GOLDFISH SOCIETY OF GREAT BRITAIN. A special vote of thanks was passed to Mr J. Linale who gave a very interesting address on veil tails as well as acting as a judge. Other judges were Mr G. O'Neill, Mr W. Leach, Mr J. Bundell, and Mr W. Wilson. The best fish in the show was a fine singletail bred and owned by Miss D. Morris. Other results were:

- Singletails: 1, Miss D. Morris (84 points); 2 & 3, Mr G. King (82, 80). Veiltails: 1, 2 & 3, Mr S. Tibble (77, 74, 70). Glabecons: 1, Mr B. Harbert (74); 2 & 3, Mr S. Tibble (73, 71). Brantleibonds: 1 & 2, Miss D. Morris (74, 72); 3, Mr W. Cook (72). Parrotfish: 1, Mr M. Chase (71); 2 & 3, Mrs P. Whittington (69, 68). Calcuttals: 1, Mr J. Booth (64). Para-pomps: 1 & 2, Mr T. Hulpin (71, 65). Bubbles-crown: 1 & 2, Mr R. Spinks (59, 63). Common goldfish: 1 & 2, Mr C. Spinks (78, 75); 3, Mrs M. Dudley (74). London shubunkins: 1, 2 & 3, Mrs P. Whittington (54, 54, 51). Common: 1, Mr D. Horman (78). Fatales: 1, Mr C. Spinks (60); 2, Mr B. Harbert (58); 3, Mr H. Berger (73). Grassies: 1, Mr A. Lawman (70); 2, Mr R. Whittington (72). Broadtail moor: 1, Mr A. Lawman (70); 2, Mr N. Giles (77); 3, Mr R. Whittington (74). Photographs: 1 & 2, Mr I. Fleming (71, 70); 3, Mr H. Jones (67). Veiltails: 1, 2 & 3, Mr T. Hulpin (73, 74, 70). Glabecons: 1 & 2, Mr B. Harbert (80, 77); 3, Miss D. Morris (75). Brantleibonds: 1, Mr Martin Johnson (Japan, 84); 2, Miss D. Morris (80). Parrotfish: 1 & 2, Mrs P. Whittington (66, 67); 3, Mr M. Chase (58). London shubunkins: 1 & 2, Mrs P. Whittington (72, 74). Common: 1 & 2, Mr I. Fleming (66, 65). Fatales: 1, Mr L. Roberts (71); 2 & 3, Mr B. Harbert (68, 67). Grassies: 1 & 2, Mr A. Lawman (71, 61); 3, Mr N. Johnson (70). Broadtail moor: 1, Mr H. Jones (74). Photographs: 1, Mr I. Fleming (71). Black & white prints, Mrs P. Whittington; colour prints, Mrs P. Whittington; colour slides, Mr D. Harman.

In Brief . . .

...TABLE show successes for Miss H. Morgan at the BRISTOL AS October meeting included first places in the labyrinth, soy egglayers and coldwater plant classes and first, second and third in tropical plants. Mr G. Benn won in the soy coldwater fancy fish and 'shubunkins bred 1973' classes.

...LLANTWIT MAJOR AS won the interclub contest with PENARTH AS by 12 points to 8 (the final zone 3 eliminator in the CNAA knock-out competition). The club were also winners of the interclub quiz by a narrow margin in an exciting finish.

...ILFORD & DA & PS found the recent talk and practical demonstration by Mr Roger Edwards most interesting. The subject was the D.I.Y. manufacture of fibre glass fish ponds and fibre-glassing in general.

...A TALK by Mr Stan Lloyd on aspects of coldwater fishkeeping and breeding gave much information and pleasure to members of BISHOPS CLEEVE AS. Judging the table show for coldwater fish, Mr Lloyd awarded first place to Mr G. Fletchers' entry. Other meetings have included a slide show and talk from Mr D. Noble, slide show by Mr M. Bishop and a quiz show drawn up by Mr T. Evans.

...FUTURE visits to places of interest further afield, including a visit to the Frankfurt International Aquarist Exhibition, are being planned by the LONDON & SOUTH-EASTERN REGIONAL GROUP of the BRITISH MARINE AQUARISTS' ASSOCIATION. This follows on the great success of a behind-the-scenes visit to the London Zoo Aquarium by more than 30 members and their families. Field trips, in conjunction with sub-aqua clubs, for collecting and research are also planned.

...WHEN Mr R. Mathers lectured to WREXHAM TFS on rocks and materials that can safely be used in fish tanks, members were able to take along sample of rock, slate and wood for inspection and discussion.

... 'SPAWNING and rearing characins' was the title of the talk given by Mr Ron Matley in October to members of NEW FOREST AS.

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FOR
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FISH FOOD

A lively auction of fishes and an aquarium followed.

... FORTHCOMING events of **DORCHESTER & DAS** include the annual dinner, a skittle and social evening, a jumble sale and the Christmas party. A talk and slide show on 'Setting Up a Tank' given by Mr H. Cornick was much enjoyed.

... WHEN a local club, owing to mistaken arrangements, failed to appear for a 12-a-side competition the evening was saved for **HIGH WYCOMBE AS** by judge Mr M. Carter considering the fish on an individual basis. The winning fish was a discus heavily benched by Mr Tony Hall, who managed to take most of the other leading positions, too. On another occasion the innermost secrets of the H₂O molecule were revealed by Mr Mills to the fascination of members.

... WHEN **WEYMOUTH AS** held a 'furnished aquaria' meeting recently members were asked to dress in 5 minutes a tank already containing water and gravel. Master Paul Taylor won the light-hearted competition in which a large number of the 33 members present joined. Chairman, Mr Derek Rogers did an excellent job as M.C. The novelty jar competition was won by Mr Allan Billington.

... AT the annual Autumn Open Show of the **BIRMINGHAM SECTION** of the **FGA** Mr Don Phillimore won awards for best male fantail class, best breeders and best in show with breeders pairs. Mr D. Curry won the best female wedgetail class. The judging followed a very interesting talk by Mr Phillimore on the **FGA** judges' training course. Positions in the Trophy Competition after seven of the 12 heats are now: 1, Mr D. Phillimore, 197; 2, Mr G. Steadman, 109; Mr K. Lee, 102; Mr R. Jones, 101; C. Truman, 82; M. Dellingpole, 75; J. Crofts, 56; Mr &

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Mrs Burnell, 50; A. Charlton, 49; W. Bishop, 45.

... 41 members and visitors listened to an interesting talk by Mr R. Heap at **COVENTRY P & AS** on how he achieved his ideal decorated aquarium. Editor Mr C. Hinde reports in the Newsletter: 'To achieve his goal took many hours of dreaming, drawing and planning. Some of his ideas were unorthodox but ... the tank has stood for 5 years virtually unchanged with no great loss of fish.'

Dates for Your
Diary

1st December. **FBAS Assembly**, Curwen Hall, Red Lion Square London WC1, 8.30 p.m.

2nd December. **HORSFORTH AS** 4th Open Show, New Civic Hall, Scarborough, Puchey.

8th December. **BURY ST EDMUNDS & DAS** Exhibition of Fish, Oddfellows Hall, Whiting Street, Bury St Edmunds. Doors open from 10 a.m. to 5.30 p.m. Refreshments available.

1974

9th March. **CATFISH ASSOCIATION (C.A.)** Open Show, Ham Hall, Ham Close, Ham, Richmond, Surrey. Eighteen classes (G & H). Show secretary: Mr D. Lambourn, 7 Whorley Court, Plough Road, London, SW11 2AQ (phone: 01-243 2530).

11th April (Easter Monday). **SOUTHAMPTON AS** Open Show, Avenue Hall, Southampton. Details: Mr P. Brown, 111 Spring Road, Shirley, Southampton.

28th April. **BLAKEBOROUGH AS** Open Show, J. Blakborough & Sons, Catterton, River Street, Birds Royal Lane, Blakborough, Yorks. Details: Mr T. Barker, 41-43 Cannon Street, Blakborough, Yorks. HD6 1SE.

28th April. **COVENTRY POOL & AQUARIUM SOCIETY** Open Show. Further details (s.a.e.) from Mr S. Woodridge, 12 Ridgeway Avenue, Coventry, CV3 3BF.

... A PANEL of experts tackled a wide range of questions from members of **LEAMINGTON & DAS** at a recent meeting. The best fish in the table show was a shubunkin entered by Mr J. Smith (73 points). At the second monthly meeting a talk by Mr T. Dobson on the anatomy of tropical fish was greatly enhanced by his drawing showing the internal organs of a tinfoil barb.

... SUBSCRIPTION to the **BRITISH MARINE AQUARISTS' ASSOCIATION** has been raised to £2 (U.K.) and £3 (overseas) without badge and £2.50 (U.K.) and £3.50 (overseas) with badge. This increase was agreed at the Association's Annual General Meeting held in October and came into force from 1st November, 1973.

5th May. **OSRAM AS** Open Show, Recreation Rooms, Refuge Street, Sharn, nr. Oldham, Lancs.

11th May. **SOUTHEND, LEIGH & DAS** Open Show, St Clements Hall, Leigh, 20-26a, Essex. Club and individual furnished, miniature and marine classes. Schedule: Mr D. Hurst, 172 Tiventy Road, Southend-on-Sea, Essex; phone 070976.

12th May. **GLOUCESTER AS** Open Show, Education and Leisure Centre, Peasemick Road, Gloucester. Schedule (February): Mr B. Walker, 41 Hales Road, Gloucester.

12th May. **YEovil & DAS** Open Show. (Details later).

19th June. **SWILLINGTON AS** Open Show, John Swanton School, Barwick Road, Swarbroth, Leeds.

26th June. **HIGH WYCOMBE AS** Open Show, Lane End Hall, High Wycombe, Bucks. Details: Mr R. Lewis, 20 Meadow Walk, Tyler's Green, Busk, HP10 8DG; phone Penn 4286.

22nd September. **TORRAY AS** Open Show, Torray Town Hall.

WEYMOUTH AS wish readers of 1973 and fellow aquarists club members a Happy Christmas and a Prosperous New Year. Visitors to Weymouth during the Festive Season are invited to join the Society's meetings held on the second Tuesday of the month at 7.50 p.m. at the Ratcliff Hall, Queens Road, Radipole Spa, Weymouth.

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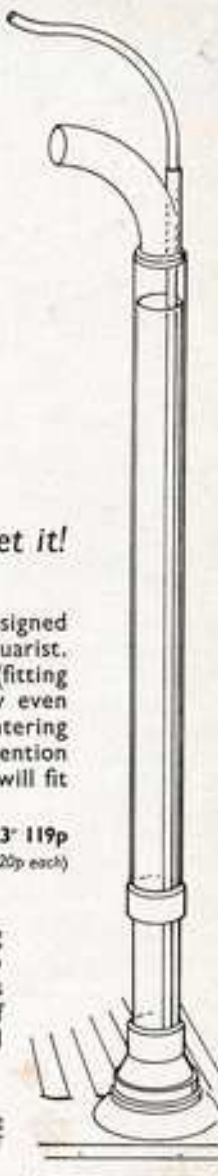
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