

DECEMBER 1972

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LETTERS

Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London SW17 0NY

National Federation

I WAS interested in the letter by Mr R. Dove, Treasurer of the FBAS, and particularly in his remarks re the London basing of the Society. In writing about this I am quite sure he does not realise the deeply rooted antipathy most northerners have to any London-based controls. This undoubtedly stems from London Government in everything, and having to request London for permission to erect traffic signals etc., when it is known that the people dealing with the request have no knowledge of the local conditions. Sending in a report and a plan does little to correct this.

The FBAS has all its meetings in London, and whilst I am aware it has a scheme for proxy voting, this is not really satisfactory as most committee work is done by discussion, and a proxy vote does not enable one to take part in this. His note that 50% of all known societies are affiliated can be construed both ways: 50% are not, and at present they are getting along all right.

Now, what I have written above may give the impression that I am against a National Federation. I am not, but what I would like to see is a Federation in which the whole of the local work is carried out by Area Branches, with the Headquarters (wherever sited) acting as a co-ordinating body only. The real objection to being ruled by a southern body would then be obviated.

Regarding judges and standards, I agree they need drastically revising, particularly the straight graph of points for size, which is ludicrous, and also the one of points for difficulty of breeding, which should be scrapped altogether. Most of the judges ignore both of them, and I should like something to be written into the standard which says that size should not be given preference over quality. Another thing I should like to see is the institution of a series of standard show containers, which ought not to be too difficult by using only the plastic aquariums available today. Most fanciers—rabbits, birds, mice etc.—have standard show containers, and the exhibits certainly look better shown that way.

Finally then, the FBAS has the right idea; I agree with it, but the emphasis is wrong. It should be on Autonomous Area Districts, and not on the Headquarters, which I also think would be better situated near the centre of this island. What do the Scottish and Welsh people think?

Bingley, Yorkshire

F. W. COLES

Collecting Marine Fishes

REGARDING your September issue, 'Personal Comment' by Arpee, I would be very interested to hear about the collecting of marine fish with poisons, in the Far East. I certainly agree with Arpee.

As you know, we have always been totally against collecting marine fish with drugs or any chemicals and I have constantly castigated the drug collector in all of my books and my SALT WATER AQUARIUM MAGAZINE. Any collector who has to resort to drugs or chemicals isn't worth his salt as a collector.

I collected for over 15 years as a full time collector and found that I could get all the fish I ever needed without drugs or poison. Anyone else can do the same. In fact I just published a huge book specifically about collecting, THE MARINE COLLECTOR'S GUIDE, which gives complete instructions to the person who would collect marine fish either as a hobby or a full time profession, without the use of drugs or poison. It can be done and the hobbyist will get a fish that will live better and he will at least have a chance to keep it alive for a reasonable length of time.

ROBERT F. L. STRAUGHAN
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The Aquarium Show '72—Special Thanks

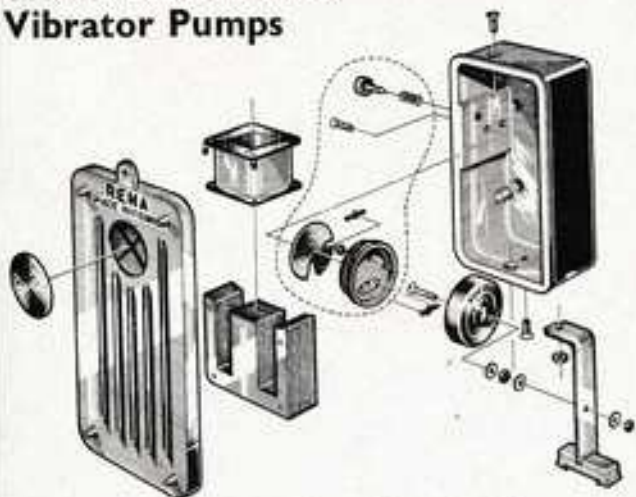
AT The Aquarium Show '72 it was my privilege to be the Show Secretary. It was a job made very easy by the very willing helpers I had with me. I was very surprised by the number of people who volunteered their services. Strangers to me came up and said they would like to help. You would be surprised at the boost it gives you when, after working hard for 4 days to get the Show ready, some total stranger walks up and asks if they can help in any way. I would also like to thank all the people who came up and said what a good Show it was. It makes everything seem worthwhile. So to Dave, Trevor, Jock, Tony, Sid and Sybil, may I say a very special thank you, and to everybody else who helped no matter how small the job—thank you very much.

BON KERRIDGE

Show Secretary, The Aquarium Show '72

More letters on page 370

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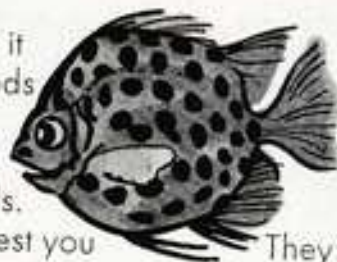
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LETTERS

continued from page 370

I WOULD like to thank publicly, through your magazine, the many friends from various aquatic societies who helped me get Caesar to 'Blue Peter', The Aquarium Show, and home again safely, for without their help none of it would have been possible. They are Dave Bewick, Pat and Derek Lambourne, Tony Bullock, Jim Connolly—and Harrow Green Aquatics for loaning the tank; and many others who lent a hand when it was needed. My grateful thanks to one and all.

Ilford, Essex

MRS SYBIL HEDGES

I WOULD like you to publicly convey my thanks on behalf of the British Marine Aquarists Association, through the media of your magazine, for allowing us to have a display at this year's Aquarium Show. The stand was besieged by members, would-be members and new members from opening to closing. I am not sure of the figures of new members, but I know that the word has been spread far and wide that we are a Society that caters for the beginner and the expert alike. We shall be looking forward to next year and hope we may stage another stand.

Torquay, Devon

L. DOUBLEDAY
BMAA, South-western Group

Wild Cichlids in Texas

SOMETHING which might be of interest to readers of PFMT is that we have at least three species of *Tilapia* living wild in Texas now: *T. mossambica*, *T. nilotica* and *T. zilli*. A friend who works for our Texas Parks & Wildlife Department brought me a very large male *T. nilotica*, which he caught in a local lake in midwinter. The day was quite cold and the fish was almost chilled to death when he brought it, since it had been removed from a canal which has water warmed by flowing over electric turbines and placed in a bucket of water from the other part of the lake. They caught about 50 of these fish by seining the canal that day. The fish wintered successfully in the warm water effluent and moved out into the lake as the water warmed. Although the approaching cold weather will kill most, a population will probably successfully winter in the canal again.

Waco, Texas, U.S.A.

BRAZ WALKER

Threat of Aqua-Lib?

THE all-male committee of Hendon & District Aquatic Society have asked me to write to you with the object of getting the following warning to other societies and at the same time ask for help.

Not only has Women's 'Lib' invaded the Stock Exchange, Parliament and cricket, but at Hendon we have noticed a distinct liberated attitude amongst our womenfolk. Whereas once it was the privilege of the menfolk to slip out for a 'quick one' during the odd boring lecture (usually given by a member of the committee anyway), at a recent meeting it was mentioned that the females were conspicuous by their absence. They later reappeared, some worse for wear and strongly smelling of the grape or grain, proudly announcing that they were not satisfied with the performance of the committee and were setting up a rival organisation, the precise function of which they would not discuss. However, after much 'undercover' work by one of our agents, it was discovered that an all-female night out in the depths of Soho had been organised.

This we feel is only the thin end of the wedge and, faced with entertainment of this nature, foresee defections by some of the weaker members, with the result that come the A.G.M. we may be in danger of losing our jobs. True, we have counter-attacked, but feel that Keith Purbrick on Characins (again) or Bob Esson is hardly likely to compete with some of the establishments in Soho.

Should any other committee have faced this menace and, what is more important, overcome it, or if anyone has any ideas where we went wrong, we should be pleased to hear from them.

London, N.W.2

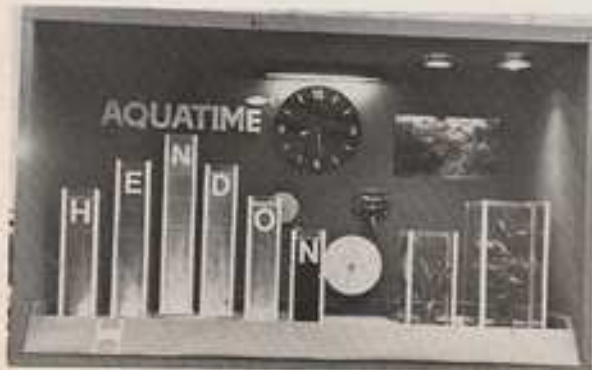
R. S. THOMPSON
Show Secretary, Hendon & DAS

In Praise of Goldfish Standards

THE Goldfish Society of Great Britain was founded for the goldfish fanatic and breeder. Now new standards of a high quality have been published at the reasonable price of 40p post paid (from Mr R. A. Dodkins, 107 Cobham Road, Seven Kings, Ilford, Essex) and deal with 13 popular varieties. If you are a keen goldfish fan or breeder then I urge you to get this Standards booklet, or better than that, join the GSGB. As this way we will be able to aim for the same standard in each variety of fish, thus eliminating the chance of the judge 'choosing the fish he likes'. Also, it will be easier to be put in touch with persons who have established strains that you are wanting. If goldfish fans and breeders did this, then the goldfish would be able to attain the high standard it once had.

M. Tita, Yugoslavia

STEPHEN PAPISTA



London's

THIS year, the aquarium societies, at their own request, were given greater space for the construction of tableaux and the results seen at the Show were certainly a case of 'bigger and better'. Increasingly, year by year, it has been necessary to search for further superlatives with which to describe the tableaux staged at The Aquarium Show, but at this fifth annual show the entries excelled over previous years and were carried out with the most amazing attention to detail. Whether artistic skills are encouraged by contemplation of our fishes and efforts to devise suitable environments for them, or whether artistic ability is a particular attribute of those that follow the hobby of fishkeeping, might be an interesting avenue to explore. Certainly one visitor, a lecturer in model-making, could hardly find sufficient words to express his admiration and pleaded for photographs to show to his students.

The range of themes was wide. Ealing & DAS white-robed druids (Mr John Batts and Mr & Mrs Marsh helped present this) marched in solemn file through the numerous 'rooms' of a polystyrene Stone Henge, while on the Erith & DAS stand prehistoric monsters with ferocious white teeth and red flashing eyes roared and spotted by a waterfall and gravelly river bed.

Mr P. J. Cooper and Mr R. Brooks of Hunslow & DAS, back in the 20th century, helped to present a tableau of the moon's surface complete with space map, moon module and planned mini-tank/rubber-tracked moon buggy. Elsewhere a magnificent train with steel-edged wheels, a replica in every detail of one built in 1847 in Massachusetts, ran along a gravel track against a background of snowy mountains and among those who helped devise this for Southend & DAS were Mr A. Channon, Mr Adams, Mr Gardiner and Mr Norris. Those who failed to get in to see London's Tutankhamen Exhibition had only to visit The Aquarium Show to see a scene brilliantly devised by Havant & DAS of the king in his golden coffin complete with gold and blue mask in a setting decorated with exact replicas of Egyptian wall-paintings. Snow White and the Seven Dwarfs were the theme of the Beck-

Winning tableaux: FIRST, Basingstoke AS (top picture); SECOND, Isle of Wight AS (centre); THIRD, Hendon AS (left)

AQUARIUM SHOW '72

well & DAS tableau and the models made by Mr and Mrs Jordan and family and other members of the Society with infinite skill were the delight of young visitors to the Show. Rummyeole AS (South place winners) chose to emphasise their origins with a replica of the signing of Magna Carta in a field close to the battlements of Windsor Castle with the King, barons and their squires encircled by a gurgling Thames flowing along (apparently in its original unpolluted state as goldfish were sporting in it).

The Pisces tableau was designed to demonstrate the different facets of the Society's many activities—since members are not only fishkeepers but also enjoy finding out what makes aquatics 'tick' a small laboratory was displayed; a selection of colour slides emphasised the club's slide-making programme. United AS presented eight beautifully arranged tanks, for which Mr Dave Watts' skill helped to acquire seven awards—two first, four seconds and one fourth. New Society Welwyn Garden City, at very short notice, had devised a clever tableau in which three tanks formed the eyes and mouth of a giant 5-ft. face. Clapham AS seized on the decorative effect of coloured fish pictures to enhance their stand. The Portsmouth AS exhibit depicting the



Mr Alec Fraser-Brunner (left), curator of Edinburgh Zoo Aquarium, and Mr Colin Roe, two well-known visitors to the Show. Mr Roe gave a lecture for the British Koi-keepers Society



Show secretary Ron Kerridge with BBC radio interviewer Dilys Morgan during a recording session held the day before the Show opened

'cod war' enacted against a background of the aurora borealis, showed an Icelandic harbour complete with polystyrene ice, fishing trawlers, armed frigates, eskimaux, igloo and polar bears. Maps of the fishing grounds in dispute, with types of fishes caught and cuttings from recent newspapers made the exhibit topical, most informative and educational.

Hendon & DAS (third place winners) had realised that the wack-



Below: left, Bracknell AS highly colourful Snow White scene and right, the Welwyn Garden City AS tableau



Havant & DAS 'Tutankamen' tableau



Microscopes included on Pisces AC tableau

end of the Show would see the clocks put back and presented their own Aquarium, with a water clock set against an eye-catching series of glass columns filled with coloured water through which air bubbled in never-ending streams.

How to describe adequately the second place winner? The Isle of

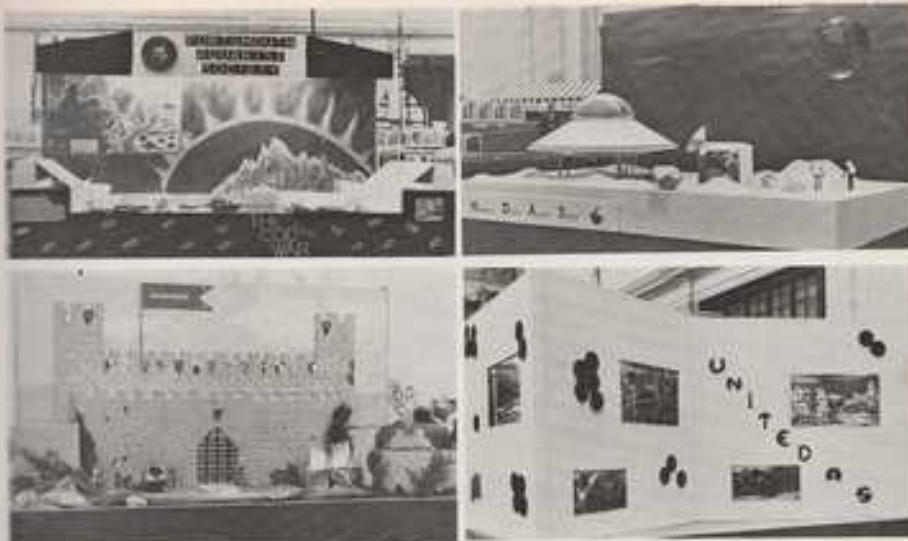
Wight AS presented a startlingly beautiful scene of the front face of the Taj Mahal, skilfully carved out of plaster and polystyrene, with golden frosted domes and carving. The entrance was filled with a tank of fancy goldfish and the marble-faced canal leading up to the entrance and housing minute goldfish fry did

no injustice to the Shah Jehan's original plan.

Finally, to this year's winner. Ilminster & DAS won the competition for the second year in succession with a Cornish harbour scene from the past that simply was a Cornish harbour down to the last detail—the houses rising steeply



An impression of the wide variety in presentation of tableaux is given by these views of the entries by (top) Clapham AS and Southend, Leigh & DAS, and (bottom) Erith & DAS and Ealing AS



Top: Fortmouth AS presented the Cod War and Houlston & DAS showed man on the moon. Bottom: Runnymede AS Magna Carta scene and United AS beautifully arranged tanks

from the harbour and the light-houses winking over 'Jim Kelly's Fish Shop' and the war memorial with its engraved list of illustrious names and the sprigged dog and the fishermen along the harbour wall.

Visitors to the Show greatly enjoyed the chance to look once again at 'Show Boat', the 1971 winning tableau by Basingstoke & DAS that was given a TV screening last year. Thanks are specially due to Basing-

stoke members for their extra efforts in erecting 'Show Boat', and for all competitors, visitors and the Show organisers record their appreciation of the delightful spectacle formed by the tableaux.

Results from Individual Classes

ONCE again, at this year's Aquarium Show, the snakehead belonging to Mrs S. Hodges of Bettel Green AS covered himself in glory. He was awarded the Scanco trophy for best fish in the Show, the award for the best exhibit entered by a lady, the Ted Jessopp Memorial trophy for best tropical egg-layer classes B-M and the Elheim trophy for the best tropical egg-layer, class M. Another very successful exhibitor was Mr P. Moye of Blatchley AS, the competition with the most points, for which he received the Pet Library trophy. Mr Moye, who is only in his second year of fish showing, had nine fishes placed out of the twelve he entered and received first prizes for the mollie, danio and Corydoras classes, as well as third and fourth Corydoras, second and fourth platys, a fourth for mollies and a fourth in the labyrinth classes. The Society

with most points were United AS (Taylor Smith trophy) and they also won the T. Horeman Rose Bowl for the best society furnished aquarium. The Phillips Cup for the best individual furnished aquarium was won by Mrs B. Cowell of United AS. Other



Peter Cairns of Runnymede AS in celebratory mood at the completion of staging his Society's tableau at the Show



Left: FBAS chairman Bob Eason (left), who presented the awards at the end of the Show, is pictured with Supreme Championship Award winner Mr R. Hiley of Basingstoke AS

major award winners were: **FFS** trophy for barbs, Mr E. Bird (Spa Discussion Group); Halvin Cup for characins, Mr R. Wright (East Dulwich); Peterana/Hyko Cup for best dwarf cichlid, Mr F. Willis (Plymouth) who also received the Marsh trophy for best cichlid, Mr D. Dare (Independent) won the Kinnel trophy for best labyrinth. The Rems trophy for best egg-laying toothcarp was won by Mr L. Emsden (BKA); the Johnson trophy for best catfish by Mrs M. Neibersell (Riverside); the Inter-Pet trophy for best catfish, class H, by Mr P. Moye; the Tetramin trophy, best rasbora, by Mr D. Armour (Riverside); **FFM** trophy, best danio or minnow, by Mr P. Moye (Blechley); Longlife Medal for best loach, by Mr L. Brazier (Sudbury); 'Trophy' trophy, best male guppy, by Master M. Baggot (Anson); FGA Shield for best female guppy, by Mrs Howe (Anson); Penguin trophy for best platy, by Mr J. Hatts (Ealing); TFH/Miracle shield, best mollie, by Mr P. Moye; Boughton trophy for best goldfish, by Miss D. Morris (GSGB), who also received the Longlife plaque for

best coldwater fish; FBAS Council trophy, best native and foreign, class W, by Mr E. Davison (Isle of Wight AS); BMAA shield for marinas, class Ya, by Mr B. Wilkinson (BMAA); BMAA Perpetual trophy for marine class Yb, by Mr L. Doubleday (BMAA).

Aa, 10 entries: 1, United AS (76); 2, Herndon AS (501); 3, Portsmouth AS (58); 4, 4 entries: 1, Portsmouth AS (75); 2, United AS (66); 3, Isle of Wight (55); 4, 9 entries: 1, Mrs B. Cowell (68); 2, Mrs J. Salebury (57); 3, Mrs Page (56). **Ak**, 4 entries: 1, Mr J. Gerrard (64); 2, Mrs B. Cowell (63); 3, Mrs W. Harroworth (60). **Al**, 6 entries: 1, Ealing AS (76); 2, United AS (75); 3, Waverley AS (67).

B, 25 entries: 1, Mr E. Bird (yellow-fin loach, 50); 2, Mr P. Jarvis (guppy, 70); 3, Mrs Tucker (schubert), 70; 4, 18 entries: 1, Mr R. Wright (Danichodes affinis, 51); 2, Mr J. Howe (olive tetra, 50); 3, Mr D. Dare (Africanus, 74); 4, 22 entries: 1, Mr D. Dare (L. Swinhorn, 70); 2, Mr D. Swinick (C. ornatus, 69); 3, Mr D. Howe (White's comet, 77). **Da**, 5 entries: 1, Mr W. Rowe (marble angel, 78); 2, Mr T. Butler (Oscar, 77); 3, Mr D. Pascock (marble, 74). **Ds**, 21 entries: 1 & 2, Mr P. Willis (T. sumneri, 81, 78); 3, Mr P. Tee (P. ornata, 79). **E**, 21 entries: 1, Mr D. Dave (C. Anguillae, 74); 2, Mrs S. Hedges (C. Anguillae, 73); 3, Mr E. Davison (concolor, 74). **Ea**, 22 entries: 1, Mr W. Rowe (78); 2, Mr C. Gray (77); 3, Master M. Baggot (76). **F**, 15 entries: 1 & 2, Mr L. Emsden (Nv. melanostomus, 81);

Aplocheilichthys latipinna, 81); 2, Mr G. Carruth (Afb. lat. ragganoides, 81); 3, 22 entries: 1, Mrs M. Neibersell (L. bicolor, 81); 2, Mr R. Wright (Afb. latipinna, 81); 3, Mr A. Taylor (plus lat. 80); 4, 25 entries: 1 & 2, Mr P. Moye (C. ornatus, 80; C. coelestis, 78); 3, Mrs M. Neibersell (Afb. lat. 12 entries); 4, Mr D. Armour (A. maculata, 70); 5, Mr E. Harvey (R. dussanovi, 78); 6, Mr J. Howe (R. dussanovi, 77); 7, 13 entries: 1, Mr P. Moye (pearl, 74); 2, Mr R. Burbane (pearl, 70); 3, Master M. Baggot (pearl, 69); 4, 17 entries: 1, Mr L. Brazier (black, 60); 2, Mr D. Armour (marina, 70); 3, Mr D. Moor (Bl. Java fish, 78); 4, 15 entries: 1, Mrs S. Hedges (concolor, 68); 2, Mr D. Bewick (pearl, 81); 3, Mr P. Constant (gold fish, 81). **G**, 27 entries: 1, Master M. Baggot (77); 2, Mr D. Baggot (75); 3, Mr R. Thordley (74). **P**, 27 entries: 1, Mrs Howe (73); 1 & 2, Mrs Howe (73, 74); 3, Mr J. Goddard (73); 4, 18 entries: 1, Mr J. Barn (P. variatus, 73); 2, Mr P. Moye (moon, 74); 3, Mrs Howe (black, 71); 4, 16 entries: 1, Mr P. Moye (blue/grey, 66); 2, Mr B. Robinson (blue/violet, 71); 3, Mrs Howe (blue), 70). **Ua**, 5 entries: 1, Mr R. Wooten (74); 2, Mr E. Davison (81); 3, Mr S. Chapman (67). **Ub**, 3 entries: 1 & 2, Mr H. Berger (71, 69). **Uc**, 8 entries: 1 & 2, Miss D. Morris (78, 69); 3, Mr L. Roberts (58). **Ud**, 7 entries: 1, Mr I. Roberts (54); 2, Mr H. Berger (53); 3, Miss D. Morris (53). **Ue**, 3 entries: 1 & 2, Mr J. Woodward (45, W. 3 entries); 1, Mr E. Davison (54); 2, Mr W. Rowe (60); 3, Mr J. Woodward (45). **Ya**, 7 entries: 1, Mr B. Wilkinson (moon varata, 81); 2 & 3, Mr L. Doubleday (Grimmia lutea, 73). **Yb**, 20 entries: 1, 2 & 3, Mr L. Doubleday (Craspis loachina, 77); *Gobius pagannulus*, 74; *Blen. gattorugine*, 73).

FEDERATION



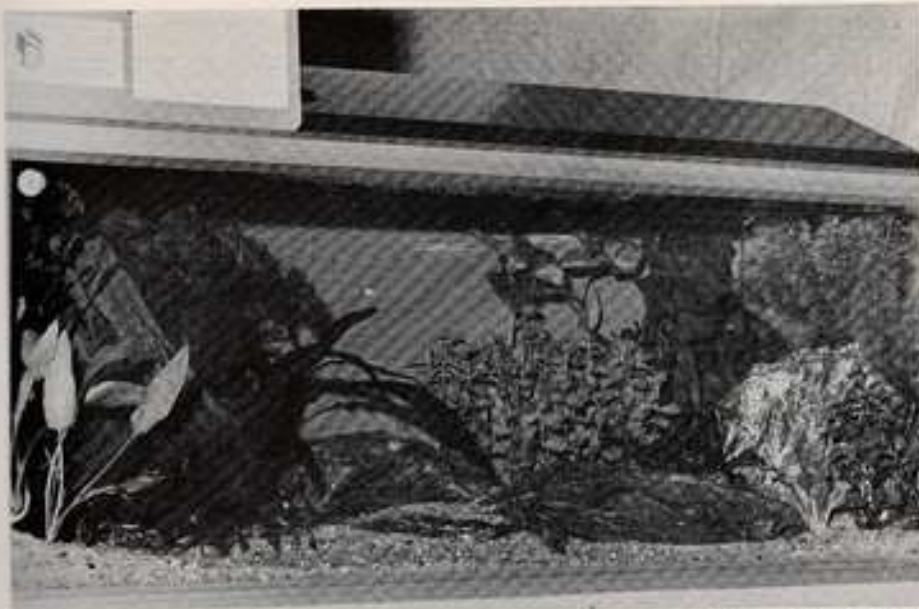
NEWS

Results of the SUPREME CHAMPIONSHIP 1972

IN the FBAS Supreme Championship Class 16 of the fishes eligible were benched. The results and pointings, with comments on the fishes by FBAS judges Mr B. Baker and Mr J. Stillwell, are given here. **First:** *Polypterus ornatus*, owner Mr R. Isley (Basingstoke AS). A well-grown, well-nourished fish showing good colour; in excellent condition and deporting well. 85 points. **Second:** *Acanthopoma gypser*, owner Mr D. Lambourne (Roehampton AS). An excellent fish, good size and body shape, showing well but unfortunately let down by slight caudal damage. 84 points. **Third:** Giant gourami *Oplethronemus goramy*, owner Mrs P. Tee (Mid-Sussex AS). An extremely good size; good body shape but scar damage on one pectoral. A credit to its owner. 83 points.

Fourth: Chola barb *Barbus chola*, owner Mrs R. Coyle (Independent AS). In superb condition and showing extremely well; its only fault is lack of size. 82 points. **Fifth:** Tom-pot blenny *Bleminia gattorugine*, owner Mr L. Doubleday (BMAA). A good-sized fish in fine condition but fails to deport. 81 points. **Sixth:** Tinfoil barb *Barbus schwanefeldi*, owner Mr E. Bird (Spa ADG). Nice clean fish, could be larger, and in excellent condition apart from dorsal fin. 80 points. *Micropeplus braueri*, owner Mr T. King (Erith AS). A good-sized fish not showing at its best. 79 points. *Aphyosemion gardneri*, owner Mr M. A. Alexander (Hounslow AS). Showing very well but slight fin damage. 79 points. Weather loach *Misgurnus anguillicaudatus*, owner Mrs B. G. Martin

(N. Kent AS). A nice fish, could be larger, but failed to deport. 79 points. Shubunkin *Corassius auratus*, owner Miss D. Morris (GSGB). Good finnage, showing well, lacks intensity of colour. 79 points. *Tilapia mariae*, owner Mr T. Kinsey (Independent AS). A clean fish but slightly hollow bellied and not showing the colour it could. Edging to caudal fin is uneven. 78 points. Guppy *Poecilia reticulata*, owner Mr A. Taylor (Sudbury AS). A good body shape but lacking colour. Caudal end slightly ragged. 77 points. Pumpkinseed sunfish *Lepomis gibbosus*, owner Mrs S. Hedges (Bethnal Green AS). Nice clean fish; a bit undersize, could be deeper in the body. 77 points. *Corydoras alvarius*, owner Mr R. Wright (E. Dulwich AS). This fish not showing very well, could be thicker in the body. Anterior edge of dorsal fin ragged. 77 points. Variatus platy *Platyposyllus variatus*, owner Mrs D. Cruckshank (Ealing AS). This fish has a poor body shape and lacks colour intensity in both body and fins. 77 points. Leopard danio *Brachydanio frankei*, owner Mr R. Newman (Uxbridge AS). This fish is past its showing best. Has severe body damage on one side. 75 points.



Winning furnished 36 in aquarium in the Aquatic Retailers' Competition at The Aquarium Show was this entry by the House of Fishes (Hemel Hempstead). Choice of winner was made from a ballot of votes recorded by visitors to the Show. Second was the tank from Manor Pet & Garden Store (Kuslip), third was the entry from Simcol Aquatics (Hounslow) and fourth award card went to Trippas Tropicals (Birmingham). A shoal of cardinal tetras was used in the winning entry with furnishings including white compost and petrified wood set against a blue background.



Mr & Mrs Roy Skipper with the FMS Shield won by the House of Fishes at The Aquarium Show '72 in the newly instituted Aquatic Retailers' Furnished Aquarium Competition.



Show Comment

By ARPEE

I HAVE never been a kindly critic of fish shows, mainly because I don't think the fish enjoy them. Thousands of aquarists would disagree with me on this point, and they turned up in strength again at this year's AQUARIUM SHOW just to demonstrate how misguided I am. I went along, too; it is one thing to be prejudiced and quite another to be dogmatic. These impressions are therefore the wanderings of an innocent rather than appraisal by an expert on such events.

I arrived before the official opening to take a look behind the scenes, and I was amazed to find apparent chaos. The few busy and harassed individuals, under the direction of show manager Cliff Harrison, who hustled here and there would surely be quite unequal to the task ahead! Strangely, though, as the minutes ticked away

the scene was converted to order and ultimately to an exhibition. The bits were all fitted together, the spaces got filled in, and the key people were all doing their stuff. The good-humoured cooperation that went on all the time between the FBAS officials, Society workers and organising team had to be seen to be believed, and there was unending patience and understanding by everybody involved. A common objective certainly works wonders.

Opening Day was dull and drizzly outside, but inside the scene was brightly coloured orange and blue and enlivened by the wide variety of styles of both the tableaux and trade stands. I would have liked to see more of the latter as these shows are as much Trade Fairs in the eyes of visitors as pure exhibitions of livestock, but, as it was, a wide spectrum of interest was covered.

I was just recovering from the fascinating and beautifully arranged stand of one of the specialist societies, the Cactus and Succulent Society, when the possibilities of the Orcon automatic bird and fish feeders revealed themselves, and it seems that for between £11 and £14 one can now minimise holiday fish-feeding worries. There is a hire service becoming available for those unable to afford to buy outright. The Impeller/Rena stand displayed an as yet unreleased aerator/ventilator equipment named Mistral, which provides a horizontal form of output called 'curtain aeration', via a bar-shaped device. Another eye-catcher was the Tachbrook Tropicals Ltd display of freshwater and marine fishes as joint tenants in a tropical tank conditioned by a preparation labelled Aquamarin Both. The specific gravity was, incidentally, 1.005 at about 75°F. The wide range of books on the TFH, Aquatic Book Service and rest stands made me more conscious than usual of my need to read more, and I hope that the reader will be likewise chastened. A vast choice of shells and corals were heaped on the Sarogny Art Products stand and on the display by the Southern Zoological Company. Amphill Aquatics and Hobby-Fish had choice plants on view and the latest foods, equipments and accessories were available from the King British, Armitage, Eric Woods and Neals Nurseries stands.

Specialist societies were represented by the Goldfish Society of Great Britain, the British Cichlid Association, the British Koi Keepers Association, the Fancy Guppy Association, the Federation of Guppy Breeders Societies, the British Ichthyological Society, the British Killifish Association and the British Marine Aquarists Association. The British Killi-

fish Association project was, for my money, one of the best at the Show, because it told you something of what the game was all about. This is just the sort of approach that should win, and deserves to win, a growing membership. The British Ichthyological Society also gladdened my eyes with a somewhat oddly arranged but beautifully representative collection of native fishes, all of which looked first-class. Unique, so far as I was concerned, was the effort and skill of Lewis Doubleday of Torquay in staging his fascinating and gorgonous tank of native marines from Torquay Harbour. It was most inspiring and revealed the wealth of life around our shores, of which we are largely ignorant, and will have attracted much interest towards the BMAA. Their stand was further enhanced by the tanks of tropical marines set up by the Association's President, Mr Graham Cox.

Much loving hard work and attention to detail had gone into the society tableaux. There was a professional elegance about the Hendon AS 'Aquarium' exhibitor that made it for me, just about the most attractive stand of all, but for aquarium know-how the United AS furnished tanks made a lasting impression.

Elsewhere, the furnished aquaria in the Aquatic Retailers' Competition will have made their mark, but I hope that the number of these will be greatly exceeded next year. Their all-round excellence will have made voting for no. 1 a most difficult process, and I would have had to draw lots.

The fishes in competitive classes

were, as a group, less impressive to me than the rest of the Show, mainly because the individuals generally look embarrassed in their soulless and colourless containers. Regal, though, many of them turned out to be, and they duly gained their honours. The cutfish—so many—particularly impressed me, and I made a quick calculation of the percentage of species I actually knew from experience, and then hurriedly deleted it from my notes. It was at this point that I feel most shows fail. They set out to reveal, to impress, to stimulate, to recruit, and to attract business. Every show, every exhibitor, should also aim to educate the visitor, and possibly win him across. No fish should be without a label, and every tank should list its contents. There should be descriptive—even warning—information where appropriate, big enough for those who are crowded out at the back to see. Many of the exhibits speak volumes to the initiated but went way over the heads of newcomers.

Quite the most fascinating experience for me was the meeting up with so many pleasant, friendly and helpful people, too many to list, but including Fred Campbell and the team of helpers. I was especially grateful for the introductions I received to many visitors, but I confess to a particular sort of sensation in at last meeting Jack Hems, one of my schoolboy heroes. It was things like these that made it a wonderful day, and I hope this small tribute will mirror the feelings of others who came and saw and who will, like me, very gladly return.



Winning aquascape (class A1), entered by Ealing AS and incorporated into their tableau depicting Stone Henge

TROPICAL MARINE PROJECT—II

Taking Stock of Results So Far

By ROY PINKS

THE highly sinister events of February, 1972 which followed the miners' strike not only struck chill into many homes but also into the very hearts of people like aquarists, whose hobby depends so much on keeping things warm and maintaining adequate air supplies to the areas most in need of them. The mariner, perhaps, was more fearful of the consequences than other specialists, partly because he usually carries such valuable stock, and partly because the safety parameters within which he can work are so very tight. One could almost say that in normal times the maintenance of trouble-free marine tanks is something of a struggle: in conditions of positive hardship things could well become intolerable.

It may be recalled that the restrictions of power came with almost dramatic suddenness, and once they had arrived one had to budget for conditions in which up to 12 hours a day had to be suffered without electrical aid. In practice this consisted of three periods of 4 hours separated by 'on' spells of the same length. It so worked out that 2 days out of 3 were those of uninterrupted supply, but the third day presented every sort of problem. The worrying thing from the very beginning was the real prospect that if things got out of hand there would be no more than enough power to keep most of us alive, and in these circumstances the future for our marines looked black. At best, tropical marines would surely need the most careful attention even to enable the hardier species like damselfish to survive.

It seemed likely that the failure of undergravel filters would wreak havoc in the colonies of the beneficial bacteria that hold the balance for us, which would push up the harmful nitrite to intolerable amounts. It would be farewell to the butterfly fish at the very least. I raised the tank temperature a few degrees and put my faith in expanded polystyrene around the outside as a heat retainer. Paraffin heaters kept room temperatures within reasonable bounds and very fortunately the weather was unusually mild for the

time of year. The most tricky aspect was that of getting the water circulated through the undergravel filters, and since there is no DC air pump capable of taking this on, I rigged up a bicycle pump to some air tubing and linked this to the normal inlets whenever the power went off. A hand-operated bicycle pump can deliver a very fair head of air (have you ever tried it?), and at first we operated this makeshift affair for about 5 minutes every half hour. On 13th February, which was 2 days after the first power cut of 7 hours, the file fish was found dead. At the time it seemed but a forerunner of further things to come, but there was a singular absence of any sign of distress amongst the other marines, though if it is possible for fishes to display bewilderment, they certainly showed it. The very encouraging thing was that none of the fish went off its food, but I speculated on the effect of paraffin fumes on seawater, because the surface of the water in the freshwater tanks already bore a thin oily deposit, and this boded ill indeed.

During the drama of the ensuing days the tanks somehow seemed to keep going, though hardly with the sparkle of more normal times. After what seemed a good bit of a lifetime 1st March came, and with it the welcome news that no more power cuts would be made. My *Hemiochromis* unfortunately died at this point, when it seemed that relief had come just in time. For the purpose of this particular study I think the remarkable thing was not so much the demise of this fish as the survival of the remainder.

The only particular precautions I took during the crisis were to reduce feeding immediately before black-out periods and to keep measuring the level of nitrite from day to day. It was most interesting that at no times were the amounts of nitrite above normal, which seems to indicate that either the sub-gravel bacteria have a greater reliability margin than we imagined, or bicycle pumps are better aerators than they are given credit for. As this crisis wore on I gradually reduced the frequency of manual aeration until,

on the last day, it was omitted altogether. The nitrite readings remained impeccably reassuring.

As to whether these precautions were necessary, I really cannot say. Other local marinists had much the same fortune as I and none of them managed much by way of aeration. Superficially I would say that they regarded their fishes as having suffered rather more than I thought mine had. Some had had losses and few escaped without the odd specimen going off its food, though normal habits were resumed when things got easier. All in all, a very nasty situation indeed seemed to have been surmounted without much more than a general weakening of stock, and this must be reassuring reading for the protagonists of tropical marine aquarium keeping, who have consistently held it to be comparable in terms of difficulty with the freshwater side of the hobby. For my part I was little short of amazed, and made all sorts of resolutions in the candlelight that if my community survived this disaster I should surely try my hand at some of the more difficult fishes in the sunny days to come.

Since this was a period of stocktaking and soul-searching I spent a little time analysing the actual casualties, which had occurred since I set up this project the preceding summer. For the sceptic I need hardly underline the fact that the total period and circumstances were almost uniquely weighted against any real form of optimism; my initial inexperience in this specialisation, coupled with a high degree of ineptitude and topped by the biggest power crisis in history, could perhaps fairly counterbalance the dogmatism of the convert, if such I was. (I still don't know whether I am converted, even, but will say for certain in 2 years' time!)

Summary of Results

The summary in this article, of intake, deaths and survivals in my two marine tanks, as compared with two freshwater tanks, may take a little believing, but it suggests that marines are more reliable than freshwater species. Of course, you can make figures prove anything if you fiddle them the way you want to go, but the somewhat surprising situation shown in the summary even took me aback when I had done the arithmetic. The following points should be noted in qualification.

The marines marked in the summary with asterisks died because of adverse water conditions and thus seven can fairly be deducted from the total to leave seven which died from disease or disability. That is, seven out of 25. On the freshwater side, the terrifying figure of 15 out of 22 died for similar reasons. All the fishes received much the same attention during the review period,

though the high mortality among the freshwater species bought on 23rd June may have stemmed in some way from a 3 hour car journey that they experienced. Even if you exclude the danios, whose case was rather special, you are still left with nine deaths out of 16: this is not altogether untypical of certain bad periods I have had in the past when collecting the smaller tetras, and results have always been very poor when I have acquired specimens at the tail end of a particular hatch.

Causes of Death

There was not always the opportunity to carry out post-mortems on the marines, but I did send several carcasses to Mr Harold Cotton for appraisal. Two in particular were of interest. The first was a *Chaetodon ocellatus*, which appeared to be in perfect health for about 2 months and then developed a lumpy sore halfway up its side, which gradually eroded into a crater over $\frac{1}{4}$ inch across. Concurrently with this it seemed that various scales began to lift away from other parts of the body. This fish was 'attended' by a neon goby throughout its illness, but the attentions of the goby were distinctly unwelcome as time went on, probably because pain occurred each time the cleaner fastened on to the sore place. This distressing complaint was diagnosed as melanotic ulcer—a natural functional defect. *Dactylogyrus* gill flukes developed and brought about the death of the fish. For the best part of a month the fish vacillated between death and almost complete recovery. It fed extremely well until a day before it died, but no medication that I tried helped it. I dosed it with copper sulphate in the community tank and gave it separate baths in potassium permanganate or, alternatively, in a very dilute Dettol solution. Rather stronger antiseptic was applied to the actual lesion. No other fishes in the tank developed the disease, nor did the gill flukes appear to affect them subsequently. This was perhaps the most distressing and obvious disease I have encountered so far, but it was reassuring that it was contained within the single fish as there were potential victims all too available for cross-infection.

The second specimen was the *Heniochus*, which died after the power cuts. I was extremely interested to obtain an opinion as to whether death may have been in any way due to the crisis. I should perhaps add that, 2 weeks before it succumbed it displayed an odd bobbing motion in the water as though it had ingested a lot of air whilst taking floating dried food. This disturbance of stability disappeared after 24 hours or so. Just before it died it began to skulk and seemed to have had its banner fin nibbled by some other fish. I was not altogether surprised to receive

the diagnosis that the endoparasitic fungus *Ichthyophonus hoferii*, which had affected the internal organs, had caused the death of this fish. Mr Cotton noted that the fungus can develop as a consequence of debility in a weak fish, after breeding, or in dirty feeding or living conditions. It appears not to be highly infectious in a marine environment.

I chose to attribute the death of the *Hemichnus* to the first of these possible causes and sincerely hope that cross-infection is in fact as unlikely as stated, because prevention and cure are as impossible as they are for freshwater fishes. As a high percentage of freshwater fishes die of such debility every day it is convenient to use this as an excuse for marine casualties that cannot be explained by other means. It could well be that in many

cases this will prove to be more accurate than one would believe possible.

One thing seems quite certain. Any fishes, whether marine or freshwater, which get off to a bad start in any way are likely to be weakened thereby, and this can seriously prejudice their chances of living whatever is a normal span for a fish. I can pick out several fishes in my present collection, which, although apparently quite fit, will probably not be alive when this gets into print. The moral is to be quite ruthless, when buying, and never to accept fishes which look other than superb and well-filled. Even so, we have a very long way to go before we can properly cope with marine diseases because so many are hidden from us, so for the time being prevention must be the keystone of our activities.

Summary of Acquisitions and Losses

(a) Marine fishes

Date bought	Tank 1	Species	Date of death	Tank 2	Species
26. 6.71		1 Domino*	28. 7.71		
		1 Yellowtail damsel			
28. 6.71		1 Percula clown	11. 9.71		
3. 7.71		1 Neon goby	20.11.71		
9. 7.71		1 Tomato clown			
16. 7.71		1 Maroon clown*	22. 7.71		
23. 7.71		1 Pink/yellow damsel			
23. 7.71		1 Neon damsel*	28. 7.71		
13. 8.71		1 Yellow wrasse	2.12.71		
21. 8.71		1 <i>Dascyllus aruanus</i>			
3. 9.71			13. 9.71		1 <i>Dascyllus melanurus</i> *
4. 9.71					1 Domino damsel
9. 9.71			18. 9.71		1 Bicolor clown*
15. 9.71					1 <i>Dascyllus aruanus</i>
28. 9.71					2 Percula clowns
7.10.71			3. 3.72		1 Percula clown
8.10.71					1 Rainbow wrasse
11.10.71			4.11.71		1 <i>Hemichnus</i> *
16.10.71					1 Blue damsel
16.10.71		1 <i>Chaetodon acellatus</i>	4. 2.72		1 <i>Chaetodon lunula</i> (exchanged)
22.10.71					1 <i>Chaetodon mesoleucus</i> (exchanged)
29.10.71			31.10.71		1 <i>Chaetodon thysurus</i> *
12.11.71					1 Wreck fish (<i>Anthis</i> sp.)
20.11.71		1 Neon goby			
23.11.71			1. 3.72		1 <i>Hemichnus</i>
20.11.71					1 Neon goby
26.11.71					1 Cloudy damsel
6.12.71					1 Cleaner wrasse
11.12.71					1 <i>Chelman rufistratus</i>
1. 1.72		1 File fish	13. 2.72		
	32 bought			14 died	

(b) Freshwater fishes

Date bought	Species	Date of death
23. 6.71	6 Chocolate danios	Various: all dead by 1.3.72
23. 6.71	2 Spotted copeinas	28.12.71
		10. 3.72
23. 6.71	4 Halfbeaks	25. 2.72
23. 6.71	1 Platinum tetra	
23. 6.71	3 Loreto tetras	All dead by 31.12.71
4. 9.71	2 Diamond tetras	
4. 9.71	2 Freshwater flounders	5.10.71
23.12.71	2 Guppies	1. 3.72
	22 bought	15 died

Breeding the Beautiful DWARF GOURAMI



Colisa lalia

By **RUDOLPH ZUKAL**

Photographs by the author

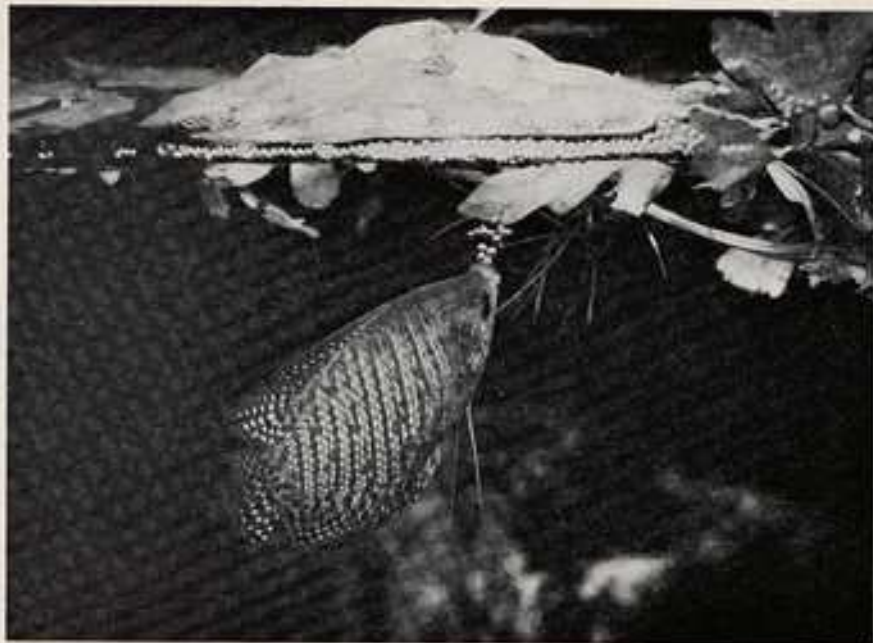
Translated by F. MARSH

IN almost all aquarium books we find descriptions of the beautiful dwarf gourami, and something about its care and handling. It is one of the most beautiful representatives of the labyrinth fishes—the Anabantidae. I don't wish to add a lot of unnecessary material to the vast amount of descriptive matter there is about this fish but the observations I have been able to make during the spawning of this species and the opportunities I have had to watch and photograph them while this has been taking place may, I think, be of value.

Not everyone may know that *Colisa lalia* was one of the first of the decorative tropical fishes imported into Europe during the 1870s, and since that time it has stayed in the foreground of interest for countless aquarists all over the world. Its popularity is assured because of its peaceful nature and the modest demands it makes as far as tank conditions and food requirements are concerned.

The home of this beautiful fish is in the most easterly part of the Indian continent—Assam and Bengal—where it lives in shallow pools, full of vegetation and lit by the strong sunlight, along the quiet side-tributaries and in the canals and ditches of the ricefields of the river basins of the largest Himalayan rivers, the Ganges and the Brahmaputra. The area stretches northwards from the Bay of Bengal through plains protected by the Himalayan range and watered by a great many rivers. The area lies

In the picture on the facing page the fish in the foreground is the female. Bubble nest-building (right) is undertaken by the male dwarf gourami, who keeps the female away from the nest until it is ready. Water plants are usually incorporated into the nest, which can form a prominent dome of bubbles on the water surface when newly made.



between 300 and 750 ft. (100-250 metres) above sea level and the frequent atmospheric depressions (in Assam on average 11-66-17-680 mm.) cause rain and flooding.

Another typical characteristic of these monsoon areas is the intense heat. From December to February the temperature varies only between 60 and 65°F (16-18°C) but in March and April it climbs to 86°F (30°C) and by the end of May often reaches 104°F (40°C). At the beginning of June the weather and temperature are influenced by the so-called summer monsoon, with its copious rainfall. During the time of the atmospheric

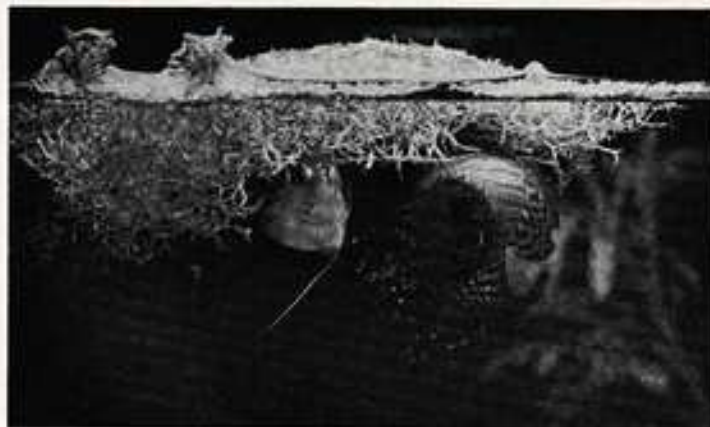
depressions the temperature falls to 58°F (14°C). In October and November the thermometer shows about 61°F (16°C).

The water is generally soft, slightly acid to neutral with only a low oxygen content and there is a large variety of live foods available in it both for the mature fish and in particular for the young fry. In the wild the fish grows to about 2½ in. (7 cm.) in length, but the maximum size reached in the aquarium is 2¼ in. (5 cm.), and the female in any case remains somewhat smaller.

The grey-brown to brownish colouring of the youngsters remains, with growth, only in the



In this picture the female is seen inverted by the male beneath the bubble nest. The male's body is closely curved around his mate's. During this embrace the eggs are ejected and fertilised, most of them rising into the bubble nest or to the water surface around the nest.



As the pair of dwarf gouramis part from their embrace the released eggs can be seen swirling between them before they rise in the water. The male collects up the eggs that do not reach the nest and blows them from his mouth into the plant and air bubble structure.

female fish. The male's colour changes from brownish red to dark red and rose red and often variegated colours. Particularly during spawning time the egg-shaped flat body of the fish glistens like a jewel. The background colouring is enlivened with blue-green at the gills, red at the eyes and 13 diagonal double stripes on the sides of the body. With its mother-of-pearl flecks distributed over the whole of the body and the fins it is almost impossible adequately to describe the beauty of the male dwarf gourami.

Colisa lala are content with a small- to medium-sized tank and are really happiest in a tank with not too deep a water level. A well-lighted environment, a temperature of 72°F (22°C) and, particularly, a plentiful supply of live food, contribute to their well-being. They are peaceful fish, somewhat shy and entirely suitable for community life. The males take part in frequent, but harmless, fights.

Breeding with 1-year-old, well-nourished fish presents no special problems. A small all-glass tank with water that is not too hard and at a temperature up to 79°F is all that is required. The tank bottom needs no substrate but two large stones may be added to serve as a hiding place for the female. Floating plants on the surface and a few small- or fine-leaved plants are necessary for the male to weave his nest from them. The two fish can be put into the breeding tank together or the female can be put in the day before the male. With the raised temperature the male very soon begins to build a bubble nest on the water surface. During this time the female is hunted and tugged, bitten and rammed in the rear—it depends on the temperament of the individual male as to how belligerent this courtship is.

The bubbles of which the nest is made are composed of air that is held in the fish's auxiliary

breathing organ and are mixed in a secretion from a gland in the oral cavity and in the bubble nest are interwoven bits of the fine plants. It is this that accounts for the great durability of the nest. The height of the nest slowly increases and when it is finished projects about $\frac{1}{4}$ in. above the water surface.

I made a rather interesting observation while I was photographing the spawning depicted here, though unfortunately I did not succeed in recording it; during the nest building, the male swam quickly to the bottom, remained a couple of inches above it for a moment and curled his whole body as though he was already embracing his mate. This was repeated several times and it seemed to me as though he must be practising.

At last the nest was large enough, the female came swimming up and the male began his display. His body was bent into an 'S' with the fins stretched wide. Beautifully coloured, he awaited his partner who came up very slowly and by a thrust with her jaws into his flank gave an indication of her willingness to spawn. The male then curled his body, the female followed and the fish moved under the nest so that the caudal fin of one was lying under the gill region of the other. At last the right place was found and the fish were almost clenched together and right beside the nest; the female was then turned on her back and soon afterwards the eggs were ejected. These were fertilised by the male at the same time. The eggs rose to the water surface and were collected by the male into the nest; but this lasted only a short time and as soon as the fish recovered the eggs were gathered up and the process was repeated. The whole spawning lasted about 3 hours. After that the female was removed and the further care of the brood was taken over by the male.

The brood hatched after about 36 hours. At this stage the water level should be lowered to a depth of about 6 inches and the male should be removed. After 3 days the young are free-swimming and must be fed with the finest live food. They are very, very small and easily choked. At the age of 3 weeks the labyrinth organ starts to

develop and they must be put back on to the very finest fry food for a further 7 days until the development of this auxiliary organ is completed. We know that this stage is reached when the young fish are seen to dart to the water surface and gulp air. From then on they must be carefully fed with fine foods.

Essentials of Breeding Tropicals

ACHIEVING success in breeding tropical fishes can be a very involved and complicated business unless a certain pattern or set of rules is followed right from the start. The fishes themselves, of course, fall into different breeding categories—the easy breeders, the not-so-easy and the downright difficult species. When people ask me 'How do you breed neons?' (or 'cardinals'), the answer is, of course, you or I don't breed them at all, the fish do. So, what are the secrets? The truth is there are no 'secrets'—it's a combination of good sense, good fish knowledge and, above all, relentless perseverance. We have all these hundreds of fine books available, covering a huge selection of breeding conditions, to enable us to select the correct spawning conditions for whatever species we are about to try to spawn. And yet we hear of so many fishkeepers who say they cannot breed certain species no matter how they try, or who have bred a certain egglayer but then have been overtaken by failure when the fry are lost. The truth is that fishes frequently won't spawn in the tank just as the good book says they should and indeed they never will do so unless you are prepared to be interested enough to put yourself out and really consider the breeding processes. It means a lot of work and time and must frequently be carried out on a basis of trial and error.

To get right down to the roots of good breeding procedure I would emphasise the following maxima.

Selecting good stock fish. This is a most important factor that I'm sure no successful breeder needs to be reminded of. Poor, weak fishes eliminate your chance of success from the start. It is also most important not to purchase just a couple of fishes if you hope for good results, i.e. never buy less than six healthy specimens, and if you can afford a dozen so much the better. Purchase young healthy stock, grow them on yourself by feeding them with a fine-class diet and then, when they reach the young adult stage, I advocate separating the sexes.

By J. LEE

This is not essential but I believe it does give better results in the spawning.

Selecting a compatible breeding pair. When the fishes have reached maturity and you decide to try breeding them they should be conditioned for a few weeks in advance on a good, rich diet composed of daphnia (red, if possible), ghost larvae, white worms, small earth worms (chopped up if necessary for the smaller species), Grindal worms, brine shrimps, fresh tubifex worms and dried scraped meat and liver. On this diet your fishes will arrive at tip-top condition for breeding. When the breeding site is ready the female plumpest with roe should be selected and the liveliest male with good colour. Just because the likeliest pair have been selected and separated, however, does not necessarily mean that they will spawn and it may mean substituting another male or even two or three before you get a compatible pair that will spawn together. Of course, it often happens that the first pair you put together will spawn. Good conditioning and timing—putting the fishes out to breed when they are willing to do so—are all important.

Care taken with the spawning tank and water used. A large number of fishes will spawn in ordinary tap water even though it is hard or semi-hard. But the more difficult species frequently require softer water and this we can provide by using pure distilled water or clean rainwater free of impurities. Hard tap water itself can be softened with filter resins and water softeners that can be obtained from a good dealer at quite a reasonable price. Or a layer of peat moss boiled in freshly caught rainwater often puts the ideal touch to breeding many of the most difficult fishes. pH values can be adjusted by using peat to obtain an acid reaction—for instance by running a little boiled distilled water through some peat moss and allowing the

water to stand before use. One of the very oldest methods of making water acid, and one still perfectly effective, was to place small elm or oak chips on the bottom of the tank. This works well when neon tetras are being bred. Also, a layer of dead, dried oak leaves has been used with success to arrive at the correct pH.

Breeding aquaria should always be cleaned out well and disinfected, with special attention paid to the corners of the tank where bacteria can lodge. After the tank has been wiped out well, bend over the top of the tank and smell it. Use your nose as a guide. You'll soon learn to recognise the clean, sweet scent of a tank ready for use.

Selecting suitable spawning media. Many egg-laying species that scatter their eggs over a wide area can be easily pleased as the spawning site can be prepared with various live plants such as fine *Fontinalis*, *Nitella*, *Myriophyllum*, bladderwort and various fine mosses. Peat fibre (which, as it helps to acidify the water, will be doing two jobs in one) is useful and also willow roots (dead and dry ones, well rinsed). This willow root makes an ideal spawning medium for a variety of the egg-laying toothcarps, especially for the top and switch spawners of the *Aphyosemion* group. Artificial spawning media that can be used with good results include upholstering packing fibre

(well washed, of course), home-made nylon wool mops attached to corks and then, of course, there are the nylon pot scourers of more recent vintage.

It is my belief that it is bad practice to feed the fishes in their breeding tank since this so easily causes contamination. Excess food particles will soon cause pollution, but on the other hand it does no harm to healthy fish for them to go without food for a week or so and indeed it tends to make them fitter and more willing to spawn. *Daphnia* is just as much a danger as feeding dried foods since they can be the source of introducing unwanted aliens or pests like hydra, which will menace the fish eggs and fry. Hydra eliminate the fry; as soon as the young fishes brush against their deadly hair-like appendages or tentacles they are paralysed so that this strange animal can consume them. Snails will also eat the eggs of fishes and all live plants must be inspected before being put in the tank so that even the smallest snail can be removed.

So, to sum up: buy good, healthy stock in the first place. Give your fishes plenty of space and good feeding and frequent partial water changes as they grow. Check on the basic water conditions required to breed them by using the books available to give the fishes at least a fair crack of the whip to start with. Understand your fishes and success in breeding them will be achieved.

An attempt to check the validity of

Theories about MOLLIES

By F. W. COLES

ONE can never generalise on the subject of fish breeding, because conditions in different areas vary so much, particularly in water chemistry and serial pollution. In my area the water is soft and naturally acid although tap water has been corrected to a pH of 7 or thereabouts. Atmospherically we are subject to a certain amount of sulphur pollution from factories, but not to an extent having lethal effects in aquaria.

These conditions prevailing, there is no difficulty in breeding killies and characins, including many of the so-called difficult ones, and as a consequence many of the local aquarists specialise in some of these varieties. But breeding livebearers is probably more difficult than in many other areas in these islands, and for this reason, coupled with the failure of a fancier's platys to breed, a series of experiments was inaugurated to find a

solution to this problem.

Amongst the various kinds of livebearers available today, there is possibly none around which so many prejudices and theories have been tabbed as there have been with mollies. Some of the more common are: (a) mollies need salt in the water; (b) mollies need higher temperatures; (c) mollies need green water; (d) mollies need hard water. It was to explore these theories more deeply that experiments were made.

With regard to the question of mollies needing salt, various people have stated previously that *Mollienisia velifera* being a brackish water species naturally, would probably benefit from it, and with this being

likely it was decided to use the species *M. longipinna* for the experiments, as they are found naturally in both brackish and fresh water.

The specimens obtained were black, unspotted, and bred true for these factors, no speckled youngsters having been produced over a fair period of time. The colour, however, was poor, the underparts being greyish, and the top body colour not really solid.

It was decided to use a temperature of 75°F as a standard, and this, if successful, would automatically discount the theory that high temperatures were needed. A start was made with two tanks—one used as a control, and the other subject to variation as required. During the course of the experiments the control mollies were outcrossed by buying in new ones, but the experimental mollies were inbred, not particularly for this

experiment but to investigate the genetical factors involved should any mutations come to light.

The control tank was kept in the house and the usual artificial illumination used to boost the daylight available, but the experimental tank was moved to a daylight position and no artificial light used at all. As it was also subject to part sunlight a considerable amount of green water was produced, necessitating the use of a power filter occasionally to help clear the tank. Whether the green water had any real effect or not could not be decided, but if it had the effect was small—hardly noticeable in fact.

It was then decided to make the water harder by the use of calcium in some form, and after toying with the idea of using limestone chippings or introducing a safe variety of calcium in a powder form, it was finally decided to introduce natural limestone as a safer measure. After all, if trout like it, it could not really be lethal. This necessitated a trip up the dales of Yorkshire to procure some, and eventually during the course of a family outing the limestone was obtained from a stream.

I had better explain that the tanks used were bare tanks, to ensure that the gravel necessary in planted tanks could have no effect, and throughout the experiment only floating plants (mostly Indian fern) were used (mollies need a certain amount of vegetable matter in their diet).

The river limestone was thoroughly washed, scrubbed and cleaned, and a large pump was placed in the experimental tank. The hardness of the water was tested from time to time, but the effect of the limestone was not very marked. The hardness did go up a little.

The effect on the mollies was not dramatic either, but over a period of time certain things became noticeable. Firstly, the number of fry per brood increased and it was also noticed that the experimental mollies were deepening in colour. During the generations produced and bred from in both tanks selection was made for colour and size in both cases, but the experimental tank mollies were definitely better, particularly in the underparts—the grey was disappearing. This was something that had not been foreseen, the main objects being the increase in vitality and health, and it was a welcome bonus. The control mollies

were beginning to look poor beside them.

I stated previously that the experimental mollies were inbred and that outcrosses were used from time to time in the control tank, so whether the improvement in colour was a result of inbreeding, or a result of introducing the limestone, only another series of experiments would decide. The fact remained that a definite improvement had taken place. This is rather baffling, as the water hardness increased so little, although it is possible that elements other than calcium could be involved.

As these experiments have achieved their object, the question of using salt in the water has been left for a later time as, whether beneficial or not, it has been proved that it is not strictly necessary, at any rate, with *latipinna*.

I mentioned platys earlier, and have not mentioned them since, but I can confirm that the introduction of limestone enabled several broods to

be obtained where previously no young were produced, or in some cases, where one brood only was obtained before sterility set in.

In carrying out these experiments several other theories have suggested themselves, and I should like to try some of them out on the rarer species of livebearers (and less inbred as a consequence) as soon as some become available. Although the experimental mollies have been inbred for so long, not one single variation or mutation has occurred, which seems to suggest that they were homozygous for most factors when the project started, which also makes the colour improvement more puzzling.

For the benefit of our novice aquarists I must stress that if they live in a chalk downs or hard water area, the introduction of limestone would have little effect, and that in any event, livebearers should be easy to breed in their areas. Perhaps they have already noticed that!

What's New?

Fluorescent Control Unit

FLUORESCENT lighting for aquaria is economical and also provides scope for those who like to introduce variety in colour of illumination. A fluorescent control unit developed for use with aquaria is the **Silver Stream** (Norwood Aquarium, 24 Knights Hill, London S.E.27), with safety features including provision for earthing, the total enclosure of the unit in a compact closed case and leads with attachments for the pins of a tube that are sealed as a one-piece item. The smart aluminium case can be opened for any replacement of parts; each component of the unit is accessible and individually removable, which is an advantage not shown by all fluor-

escent 'kits'. A range of units for all sizes of fluorescent tube, each supplied with two clips for a tube, is available, £2.49 each (postage and packing 25p extra, from the makers).

Aquarist's Diary 1973

EVEN those aquarists who do not use a diary for its primary purpose have bought the **PetFish Aquarist's Diary** as it appears each year so that they can have readily available in their pocket facts such as capacities of aquaria and weights of aquarium materials, information on glass and glazing, lighting, aquarium drugs and dosages, sea water density changes with temperature and many many more data needed to be looked up from time to time. The 1973 Diary has further information about metrication and also includes 16 pages of maps of the world in colour. For world travellers a list of overseas public aquariums is also included. The Diary is complete with pencil and page marker and is still only 49p post free from PF Publications, 554 Garratt Lane, London SW17 0NY. From the same address there is available this year a **PFM Calendar 1973**, with 12 colour photographs of aquarium subjects, 55p post free (for further details see page 415).



by
ARPEE

Personal COMMENT

RECENTLY I read that an enthusiast was having trouble with 'nervous discus'. It appeared that he had given two or three large discus possession of a very big tank, but they had failed to settle down and alternately blundered round the place or skulked in corners after becoming breathless and exhausted in their attempts to go to ground. I found this problem interesting, because it is the sort of situation often encountered with the larger cichlids and with other, usually large, fishes with the 'difficult' tag attaching to their reputation. So far as one can gather, the phenomenon is not confined to freshwater aquaria, and many marine fishkeepers are driven to distraction by the reluctance of many of their new acquisitions—usually the most expensive ones—to participate even faintly in everyday life.

The comparatively inexperienced aquarist who has nevertheless read up his subject faithfully will be doubly perplexed by this occurrence because it seems to run contrary to all the basic rules. He has not only not overcrowded his tank, but has almost achieved the reciprocal by giving his fish space enough to lose themselves in; surely there can be nothing wrong in this!

In the majority of cases understocking a tank will pay handsome dividends, and in fact this can be taken as the normal rule: it is simply that with the temperamental species things somehow seem to go wrong and measures have to be considered by way of alleviation. Unfortunately for the fishkeeper there is no certain way of overcoming the difficulty; it would be nice to be able to say that discus will react to a certain stratagem and that festive cichlids will react to another. In actual fact it does rather seem that individuals or groups of fishes will have their own tolerances, and these are not always easy to delineate.

Some reactions are easy enough for the observer to understand, as when a nervous fish swims from behind a rock into a clearing and, faced with apparent insecurity, it panics and swiftly returns from whence it came, in a sudden swirl. Others will react to unexpected noises, movements or sudden changes of light intensity, often most surprisingly.

I have often been momentarily startled by an

unexpected musical chord from the radio and have 'jumped' ever so slightly, and on many of these occasions there has been an immediate reaction by certain fishes—or by all the fishes in certain tanks, which have either taken cover or changed course almost simultaneously. The introduction of new fish to an established tank can also upset relationships, perhaps most noticeably in marine communities where the staking out of territory for living in is a prime occupation of each individual fish.

To revert to the problem of the nervous fish in an understocked tank, one assumes that there is adequate cover by way of rockwork and plants, as these are essential. An unfurnished tank in these circumstances is just impossible, but of course the nervous creatures will take full advantage of your thoughtfulness and conceal themselves until they are ready to face up to things. It is often wise—though extremely frustrating—simply to sit this out, as Nature seldom moves in the desired direction as the result of human pressure. Nevertheless, if you are trying to show off your 10 guinea tang to the neighbours you can let yourself in for a very long session if you invite them to dinner too soon.

What can be done to create the relaxed atmosphere your fishes appear to need? In some cases it will be found that a judicious feeding routine will make all the difference. It is probably true to say that dried foods have little relevance at this stage, but any moving live food can be made to work in our favour. Try using a large medicine dropper to suck up a quantity of daphnia, for example. Then insert the end into the tank water and squirt it so that the contents end up a few inches in front of where the fish is skulking. By 'angling' in this fashion, with various types of cut-up worm, brine shrimp etc., it may be found that curiosity will be stimulated and, if feeding then begins, greater confidence may come.

A rather surer way, however, is to introduce into the tank other fishes on a temporary basis, perhaps, which will convey to the skulkers a feeling of normality and thereby induce them to join their excursions. It is not easy to specify what these should be, though certain groups do quite readily suggest themselves. In the freshwater sector the catfish are wonderfully phlegmatic and their presence would have added value in that they would remove any food which continues to remain uneaten by the principal tenants.

A shoal of zebras or barbs (but not tigers) would constitute a nicely moving mass in mid-water and would not prove too expensive if the problem fishes were big enough and hungry enough to give chase. In making a choice one would have to consider local water conditions and select companion fishes which were compatible with it. In the saltwater scene the sergeant-major or small damselfish will probably fill the bill, and if the conditions are right the cleaner wrasse strikes me as another possibility.

Above all, patience and imagination are essential. Violence of any sort must be avoided, though, as fishes don't go along with it.



There has been comment recently in various circles about the vagaries of air pumps, which span the entire spectrum from their performance to their spares back-up. I may be wrong, but I have a feeling that some of the cheapest and least fancy models are, in the long run, as reliable as, or superior to, more sophisticated ones, though of course they can rarely compete in terms of air output. Just at the moment there are some exciting new models on the market and I know of some others which are on their way. A few years ago the average tropical enthusiast used an air pump more because it was the done thing than because of any firm conviction that it was vital equipment, and probably few, other than breeders, fully comprehended what the things actually did for their aquaria. Indeed, many fanciers today are still under the illusion that they are a form of oxygen supply. Nevertheless there seems to have been quite a boom in their popularity, especially for the breeder, the mariner and for those with limited space who are tempted to overcrowd their fishes and to delegate their chances of survival to a continuous supply of air at a recognised level.

It seems a pity that such a multiplicity of choice is now offered when what is really needed is a model that will run reliably from 6 or 12 volt car batteries. Although power cuts this winter now seem unlikely, there remains a future threat which it would be foolish to ignore. I am astonished that the trade has failed to cash in on the challenge, as the demand would now seem to be established for equipment which will meet a sudden and lasting emergency, even at an enhanced price.

One of the things that concerns me most about air pumps costing downwards of £5 is that, generally, their deterioration is insidious rather

than otherwise, and hence when there is a failure it is thoroughly fundamental. This is because the diaphragm gradually wears through or the trembler arm diminishes imperceptibly in performance. Then the one ruptures completely or the other falls off. Now, most dealers I know will readily come to one's aid at the oddest hours if only one can contact them, but, sadly, they plead lack of spares once you have managed to get them to the telephone. There is something very odd about all this.

If you discuss the problem with them they will say that they cannot get co-operation from the suppliers. When you write to the suppliers they seem just as puzzled and sometimes send just what you want by return and blame the retailer for failure to maintain a reasonable level of back-up spares. I could understand this in the case of some individuals, but the failures are so widespread that there must be bad communication somewhere.



My advice to those who encounter this trouble is first to try your regular retailer and then write to the trade supplier if the former blames him. Quote names and facts and report the supplier's reply back to the retailer. Let me know if any absurdities arise, but above all please set about the correspondence in constructive vein, as most parties are keen to help, but they do get put off by abusive or threatening letters. A criterion I shall certainly apply when buying pumps in future is to stipulate that I shall need at least three spare diaphragms and one spare set of rocker arms before I buy the pump. If everybody who complained did the same it would not take long for the spares situation to get right, and progressive manufacturers might take the hint and steal something of a march on their competitors.

One particularly odious practice in other trades may, of course, be at work here. This is the insistence of some wholesalers on despatching orders only of a certain value, say £5 or more, and the effect of this is disastrous on the local pet shop dealer who wants only £2 worth of diaphragms to keep his stocks right. If evidence of this sort of thing emerges, this may account for a lot, but in fairness I don't think that the pump suppliers work this way because they realise just how we depend on their products. I have found them most co-operative in wishing to iron out the snags, and hope that this may help to isolate some of the unknown impediments.



The

By

Photographs

The male fire-tailed rivulin (lower fish) is the more colourful fish and displays the red-edged tail fin that gives the species its popular name.

MEMBERS of the genus *Rivulus* are found in South and Central America and on some of the islands of the Caribbean. Their natural habitat is the fast-moving mountain streams where a continual supply of insect life forms the largest part of their diet. This is shown in their great preference for live foods when maintained in domestic aquaria.

The firetail rivulin, *Rivulus mitlei*, is not commonly available in the aquatic stores but should you come across these fish they make an interesting addition to any aquarium population. Housing them is no problem and a pair can be kept quite comfortably in a 2 gallon tank. However, if you can give them larger accommodation so much the better. Water chemistry does not seem to be of any great importance and they flourish in most conditions except extreme levels of hardness.

Planting a tank for this species should present no problem and a mixture of such diverse plants as Amazon swords and *Nitella* or *Riccia* is about the best combination. The large leaves of the sword-plants are used as 'sun decks' and *R. mitlei* are usually to be found resting on these leaves. The *Riccia* or *Nitella* makes an excellent spawning medium and will be used almost continually for depositing eggs. No special preparation is required before breeding but copious feeding with live foods probably cuts down the risk of parental egg eating. If possible, try to keep a few daphnia in the tank at all times. Some reference works indicate that rivulins can be weaned on to prepared foods, but with the firetails I found this to be incorrect. They will, however, accept all live foods and have made short work of glassworms, bloodworms,

daphnia and whiteworm. Hungry males will think nothing of chasing water boatmen around the tank. Although tubifex is accepted it has to be fresh and thoroughly cleaned before it is taken.

Having prepared the tank and given the pair the correct feeding there is little else to do but wait for the appearance of the eggs. Spawning is initiated by the male swimming close by the side of the female and contouring his body into the shape of hers. In this way he will guide her into a thicket of fine weed or algae where single eggs are deposited and fertilised. Spawning may take place continuously or in bursts, but in either case the parents need not be removed provided that they are well fed.



Magnified egg of *Rivulus mitlei* just before hatching with the eye of the fry prominent.

Fire-tailed Rivulin

S. FORSTER

by W. A. TOMEY

The eggs are quite large, being about 2 millimetres in diameter, and are almost transparent, which enables the hobbyist to study the development of the fry within the egg. At temperatures of 72-78°F (22-25°C) the eggs will hatch in 14 days at the lower and around 10 days at the higher temperature. Depending on the spawning period there are quite likely to be fry at various stages of growth, but from the moment of hatching feeding the fry presents no problem as they immediately accept brine shrimp and cyclops. Given an almost continuous supply of feed the fry grow quickly but care must be taken to ensure that pollution of their water does not occur as this species seems to be particularly dependent on clean water.

There are very few disadvantages in keeping *R. meloni*, but one of them is the need for an extremely close-fitting cover on the tank. The fire-tail is adept at finding the smallest gap and ending up on the floor. If a fly lands on the surface of the tank one is treated to the spectacle of a miniature salmon rising to the fly, as the fire-tails are quick to sense a winged insect on the water. This may be due to the vibrations caused by the insect which as it tries to extricate itself from the water sets up



Pair of fire-tailed rivulins photographed during spawning



Enlarged views of (left) a newly hatched fry and (right) a fry at 2 days after hatching. The right-hand photograph reveals the numerous pigment spots in the skin of the young fish

'mini currents' by the frantic beating of the wings.

The male firetail is a mass of colour and a run down of his personal attire would seem to qualify him for a Beau Brummel award. The eyes are black with a gold circle, the gill plates are blue, each with a green spot, the back is beige and the belly is salmon pink; the flanks are metallic blue-

green and are patterned with irregular bright red dots. The ventral and anal fins are pale yellow, edged with black. The tail fin is dark beige on the top with black edging underneath, and has the distinctive marking that gives this species its common name—a striking white patch with a red edge.

Guppy World

By
PETER
UNWIN

Like oil and vinegar, some guppy foods are inclined by their very nature to enjoy separate existences but can, on occasion, be mixed together with advantage.

Main point to watch when experimenting with such concoctions is to exclude foods that have a limited life. Topping the poll in this respect is

powdered liver. When fresh, it is a fine adjunct to any diet, but do discard it if you are in any doubt as to its freshness and don't mix too much at one time.

When purchasing new brands of dried foods do remember that guppies are often like children and soon form likes and dislikes. When obtaining

Book Review

THEORETICAL FISH by Derek McInerney.
80 pages, 14 colour plates in text, 4 line drawings. John Gifford Ltd, London, 1971.
£1.10.

THIS is a revised edition of a 1969 Foyle publication, and unlike many updates, it really reads like a 1970 version. It is a beginner's book and deals with all the essentials in an understandable and economical style, and the overall presentation is attractive and readable. It joins a welter of elementary books on the subject, however, and I am not sure that it contributes significantly to known techniques. From a tremendously painstaking description of the elements like thermostats and how they work the writer seems to forget his rôle as tutor in fishkeeping and we finish with such matters as the breeding habits of the annual fishes. This underlines the difficulty which many of the masters have in remembering their own fundamental problems when setting out on their journeys. As a strict guide for the tyro therefore, I think it falls short of what it ought to be. As a tidy dissertation on this hobby of ours it is certainly worth reading by those who already have some acquaintance with

the subject. Refreshingly it roundly condemns tubifex as food and snails as scavengers and puts pH in what is, I am sure, its proper place. Elsewhere there seem to be rather alarming simplifications, especially as regards the apparent ease of planting a tank and dealing with disease, and there seems to be a gap where routine tank management ought to be. As there is a lack of advice about the creation of compatible communities, which is what interests most beginners, some improbable associations would arise if the 'recommended species' were taken too literally. The angel, the ram and the sucking loach, for instance, are enough to drive most beginners to distraction in one way or another. There are several other points over which one would take issue with the author, respectfully, so at least there are the grains of controversy present, always a good thing.

Much less of a good thing is what seems to be becoming a Gifford habit with aquarium books—quite appalling proof-reading. I lost count of spelling errors, and there is no continuity from page 55 to 56. The plates are only just relevant to the scope of this book, but surely if one is to show a cardinal it is plain madness to have a neon of equal size just below it: the untutored would take them for male and female, as likely as not. This just isn't worthy of the author.

ROY PINES

new fish from either a commercial or a private source, ask what the previous owner had been feeding them on. If this diet isn't to your taste, gradually wean your fish over to your own ideas of Ambrosia. Sudden changes, whether of food or environment, can have disastrous results in your tanks.

If you use the outside box filters on your fry-rearing tanks you may find the fry being sucked up the delivery tubes. As small as the perforations are on the end of these plastic tubes they will still allow the passage of young fish.

Luckily it is a situation that is soon remedied. Cut a small piece from an old pair of lady's tights or stockings, stretch it over the end of the delivery tube and fasten it in place with an elastic band.

This screen won't allow the passage of large mulm, but then if you are doing your chores properly and keeping everything 'clean' then large detritus should be non-existent.

If you are using subgravel filtration, be sure to cover the filter plates or tubes with a good layer of gravel. If there is only a shallow layer the youngsters can find their way through the gravel, helped by the current of water being sucked in.

Once upon a time a fish trader whose business had felt the cruel axe of the local authority's compulsory purchase order, emptied the living remains of his labours into a canal at St Helen's, Lancs. Encompassed by the warm waters from a nearby industrial concern and nurtured by an endless supply of live food the fish prospered.

I was reminded of this unique 'tropical' fish colony whilst chatting to a friend who had visited the canal the week previously and had discovered to his amazement (and mine!) that the male guppies netted showed a tendency towards being

pintails and reasonably good ones to boot.

Whether the original guppies emptied into the muddy waters contained any of this rarer short-tail isn't known but my friend's remark will no doubt start a rush to this north-west town by lovers of this variety. How to get there? I have promised to keep it a secret until the local specialists have investigated!

• • •

Why are good fancy guppies so expensive? Is it the age old law of supply and demand? Is it the rarity that keeps the price up? I doubt it. Breeding guppies is an expensive business when one considers all the outgoings—some small in themselves but adding together to give a sizeable whole.

Discounting the initial cost of the equipment and adult fish, the guppy-ist seems firm on the idea that guppy fry should be stuffed full of newly hatched brine shrimp from birth to maturity. With the cost of these eggs soaring and calculating just how much (in new pence) each fish can consume in its time, it comes as no surprise that all these expenses must be recovered by the seller.

So the next time you purchase a pair of these fish, spare a thought to exactly what you are buying—a few minutes with pencil and paper might prove you are getting a bargain.

• • •

Even with the relative security of the Trade Descriptions Act, buying a pair of guppies is still a hit-or-miss affair, judging by the number of queries we receive on the subject. Strange how the beginner seems to think producing good fish is simply a matter of buying a pair that will have all the qualities. If you can add a proven show record of success then so much the better.

Predicting what offspring any pair of fish will throw out is like forecasting how long it will take a man to drink a pint of wallop—it depends on so many variables.

Best advice is to go to a known reputable specialist or aquatic store, purchase a healthy, active pair and then be prepared to work at them for a long time. The satisfaction of earning praise through such effort reaps its own reward and enables one to do what comes naturally to any new-born babe and men of good conscience—sleep easy at nights.

AquaGLOSSARY

No. 5

A PFM guide to the meanings and accepted pronunciation of the scientific names of aquarium subjects, arranged by word-roots in alphabetical order

Leuco (Greek): white. Pronounced 'lew-oh'. An ancient Greek name given to the white mullet was responsible for the generic name *Leuciscus* of, for example, the daec (*Leuciscus leuciscus*; 'lew-kiss-kuss lew-kiss-kuss'). In reference to the white 'chest' marking *leuco* is seen in the trivial part of the name for the powder-blue surgeon fish, *Acanthurus leucosternon* ('a-can-thur-russ lew-oh-stern-on') (*sternon*, Greek: breast).

Multi (Latin): many. Pronounced 'mull-tee'. For example, the trivial name *multicolor* ('mull-tee-cullah'), meaning many-coloured, occurs in the scientific names of the killifish *Aphyosemion multicolor* ('a-fee-oh-sem-ee-on mull-tee-cullah') and of the Egyptian mouthbreeder *Haplochromis multicolor* ('hap-low-crow-miss mull-tee-cullah'). Also the trivial name *multifasciatus* ('mull-tee-fash-ee-ah-tuss'), meaning many-banded or many-banded (*fasci*, Latin: bundle or band), in the names of *Epiplatys multifasciatus* ('ep-ee-plat-iss mull-tee-fash-ee-ah-tuss') and of the false scat *Selenotoca multifasciata* ('sel-en-oh-toe-kah mull-tee-fash-ee-ah-tah').

Cinctus (Latin): girdle. Pronounced 'sink-tuss'. Bands around the body of a fish may be referred to in the scientific name, as in the trivial parts of the names of the two-banded clownfish *Amphiprion bicinctus* ('am-fip-ree-on by-sink-tuss') and the three-banded clownfish *A. tricinctus* ('try-sink-tuss'). Also in the name of the kuhli loach *Acanthopthalmus semicinctus* ('a-can-thoff-thal-muss semmy-sink-tuss').

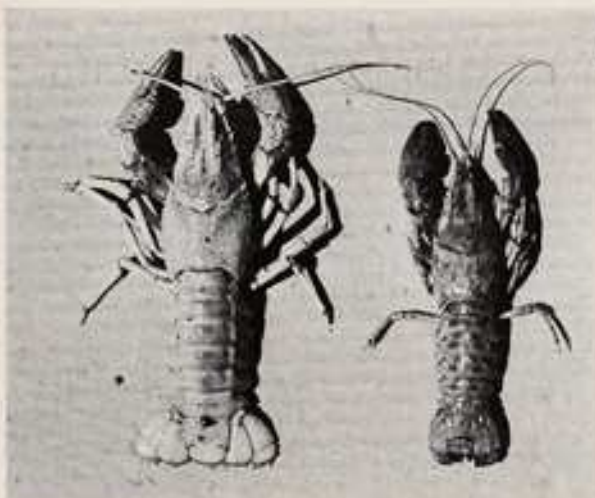
Gnatho (Greek): jaw. Pronounced 'nayth-oh'. For example, in the generic name of the well-known mormyrids or 'elephant-nosed' fishes, *Gnathonemus* ('nayth-oh-nee-muss'), some of which have a sensitive projection (*nasus*, Greek: thread) on the jaw. Also in the marine fish generic name *Micrognathus* ('mick-roe-nayth-uss'), meaning literally small jaw, and in the spiny eel generic name *Macrogathus* ('mack-roe-nayth-uss') denoting the converse—big jaw.

Quadri (Latin): four. Pronounced 'kwod-ree'. For example, the trivial name of the marine four-horned cowfish *Ostracion quadricornis* ('ost-rah-kee-on kwod-ree-corn-iss') (*corni*, Latin: horn). Also in the plant names *Echinodorus quadricostatus* ('ek-in-oh-dorr-uss kwod-ree-cos-tah-tuss') and underwater clover *Marsilea quadrifolia* ('mar-sill-ee-ah kwod-ree-foe-lee-ah') the trivial parts refer to the four ribs or ridges (*costa*, Latin: rib) on the fruits of the Amazon sword species and to the four leaves (*folia*, Latin: leaves) of the latter plant.

Keeping Crayfish in the Aquarium

By
J. C. THIEFAINE

Illustrated by
the author



Left, the swamp crayfish *Astacus leptodactylus*. Right, the N. American river crayfish *Cambarus affinis*.

UNUSUAL 'armoured' aquarium inmates are the crustaceans commonly known as crayfishes. These invertebrate animals are pincer-bearing, like crabs and lobsters, which are their sea water relations.

Three crayfish species may be considered for the coldwater aquarium: they belong to two genera, i.e. *Astacus astacus* (syn. *Potamobius astacus*), the European river crayfish, *Astacus leptodactylus*, the Galician swamp crayfish and *Cambarus affinis* (syn. *Orconectes limosus*), the North American river crayfish. Both genera belong to the

family Astacidae. I shall confine this account to our native genera or others which the British readers may meet during holidays on the Continent. I will first describe these three species suitable for an aquarium.

Astacus astacus, the river crayfish, was very common in most European rivers until the end of the nineteenth century; it preferred flowing waters, as according to the literature it requires a good supply of oxygen. The colours vary from a beautiful bluish to brownish. Not only the environment, but also the quality of

the water and last but not least the feeding play an important role in the colour pattern of the crayfish. Unfortunately the river crayfish has become very scarce nowadays, owing to increasing water pollution. This species must also resist a merciless parasitic disease, which broke out by the end of the nineteenth century. This was called the crayfish plague and was caused by a parasitic fungus of the saprolegnia family, *Aphanomyces astaci*. This infection destroyed a great many of the *Astacus astacus* population and the few surviving are now threatened with extermination by pollution. The river crayfish is still only to be found in relatively healthy areas in southern Scandinavia and remaining fairly wild regions in France and Central and Eastern Europe. *Astacus astacus* can reach a length up to 6 inches.

Astacus leptodactylus, the Galician swamp crayfish, is considerably



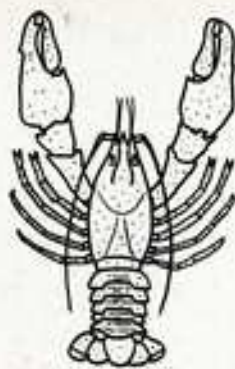
Ranges of the river crayfish in the northern hemisphere. Stippling denotes *Cambarus*, horizontal hatching denotes *Potamobius*, sloping hatching denotes *Astacus* and vertical hatching denotes *Cambaridae*.

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larger (10 inches, but most specimens are not longer than 8 inches, which nevertheless can pinch unwary fingers in quite a painful manner!) Its colours vary from yellowish grey to greyish brown. This species lives in swamps and other still waters and is therefore easier to keep in the aquarium than the above-described one, because of the smaller need of oxygen. The most obvious difference between *Astacus astacus* and *Astacus leptodactylus* is the length of the pincers, which are longer and thinner in the Galician swamp crayfish than in *Astacus astacus* (*leptodactylus* means 'with long fingers'). This crustacean lives in Central and Eastern Europe, where its range often crosses with that of the river crayfish. It originates from Galicia, a region that was shared between Poland and the Soviet Republic Ukraine in 1945, whence it has spread itself in other areas. Because of its large dimensions this species is bred on a vast scale and imported in some West European countries as a food. It can then be set at liberty and builds little colonies here and there.

The third species is the smallest one (up to 3 inches in length), but it shows more beautiful colours than the two already described. The fundamental colour is brown and every segment of the abdomen is adorned with a beautiful elongated red spot. The North American river crayfish, *Cambarus affinis*, was first imported in 1890 after the crayfish plague, because it is resistant to the disease. Nowadays the animal has spread itself in many slowly running and still waters and although it is a true crustacean we often find it in damp places poor in oxygen, where our European *Astacus astacus* could not remain alive. In some canals of Northern France (e.g. Canal de la Somme, Canal de Saint-Quentin) it can be seen in thousands. We often see them along the banks, in shallow water, at twilight or when they are about to change their skin. They occur there exclusively in the warmest season of the year, between June and August. At other times they remain in deeper water and are not visible.

This crayfish can be caught easily by means of a hand-net. Often they hide themselves under stones, which we must lift up slowly and carefully with one hand while we push the net along the bottom



River crayfish (*Astacus astacus*) of British rivers



Swamp crayfish (*Astacus leptodactylus*) of central Europe

toward the animal with the other hand. When the captured crayfish is being put into the transport pail, this operation must be performed with much care because the thin articulated legs easily remain hanging in the meshes of the net. As the limbs are very fragile we have to handle crayfish gently to avoid any broken limb. However, a broken feeler or pincer or leg is not such a serious trouble, as the amputated limb grows again with the successive skin changes. Small *Cambarus affinis* are often used as angler's bait for predators such as the river perch (*Perca fluviatilis*), the pike (*Esox lucius*) and even for predatory cyprinids as the chub (*Squalius cephalus*). Thanks to its relatively small dimensions, this species is the most convenient for the normal-sized aquarium.

Although some authors say that crayfishes can be kept in a cold-water community tank, I would personally recommend the single species aquarium. This is not because of aggressiveness (see below), but rather because fish can move rapidly and thus scare the crustaceans and also that fish can use their swiftness to rob the crayfish of their food. The aggressiveness so often ascribed to swamp and river crayfish is not quite accurate. If crayfish are given what they really need we shall have no trouble with attacks and battles. What they need is quite simple: many hiding-places! The material used to make these does not matter: pieces of slate, tile,

broken flower-pots, stones, coconut shells etc. are all perfectly suitable to build the shelters. Crayfish sometimes play the farmer and plough the soil, so in consideration of their strength (they are stronger than you may think) it is advisable to fasten the furnishings for holes and retreats firmly.

If we do not satisfy their need for secure places, they become timid and aggressive towards each other. Often we can notice a threatening with the pincers, as two beasts meet each other or as one of them comes too near the hole of a neighbour. However, I could never observe real attacks and most times the intruder draws off at the first defensive movement of the inmate. Of course, the number of hiding-places available must correspond to the number of crayfishes living in the tank. If there are more animals than shelters, the frustrated individual will become shy and aggressive and disturb the harmony of the community. In this case we would probably be allowed to attend some real fights. The best solution is to provide more retreats than we keep crustaceans. The crayfishes will then feel more secure and they can draw themselves into the first hole available when they are disturbed. Even so primitive animals as crayfishes do have a psychology!

Their tank will not necessarily be either spacious or especially high. I keep six *Astacus leptodactylus* (6 inches in length) in an all-glass

(silicone-rubber sealed) 36 in. by 12 in. by 12 in. tank and eight adult *Cambarus affinis* in a similar tank. In both aquaria the water level is 8 inches. Crayfish have crepuscular and nocturnal habits and their aquarium must not be placed in a light place. The best plan is to have the tank in a room receiving daylight through a window located on the north side of the house. Both my tanks are on a shelf 80 inches long and lighted by a Philips TL 65 lamp. The need of twilight is supplied by many floating plants, for example bunches of the coarse hornwort (*Ceratophyllum demersum*) and also small and ivy-leaf duck-

baris *affinis*, take not only live food but also vegetable foods and even carrion. Nevertheless live food such as earthworms (even 'maxi' worms of 6 to 8 inches length can be subdued easily!), slugs and snails (from the garden), all sorts of water snails and freshly killed small fishes are preferred. Worms are clutched by the large pincers and brought to the buccal apparatus by the second pair of legs, which also beat pincers, but very small ones. The large pincers of the first pair of legs are too rigid to bring the food directly to the mandibles. You can see the prey disappear slowly into the buccal cavity. The shells of

decaying are consumed completely. Maybe the smell of the decaying materials attracts the crustaceans.

However, crayfish are very clean creatures and it is always a pleasure to look at them 'washing' themselves after each meal. Pincers, legs, mouth, all parts that have been in contact with the prey are carefully cleaned. But that is not all; back, abdomen, eyes and even feelers are also cleaned by means of the legs. This grooming is also practised regularly when crayfish are on the point of changing their carapace. Perhaps these motions make the operation easier.

Skin-casting is quite an interesting event in the keeping of crayfishes in the aquarium. In this period they become agitated and often lay themselves on their side, looking very ill. Suddenly the carapace splits itself between the cephalothorax (joined head and thorax) and the abdomen and now a wonder of Nature takes place: a 'new' crayfish appears from the split. The 'new' crustacean is vulnerable to all dangers for about a week, because its new carapace is still soft. During this time the animal mostly remains hidden in its shelter and does not take food. Crayfishes which have just cast their skin are called 'butter-crabs' in some countries, because of the softness of the new skin and the weakness of the animals themselves. Skin-changing is quite a complicated and difficult process, which can sometimes take a long time. Extremely difficult casting can have the death of the animals as result. This operation may therefore be considered as rather dangerous. Normal carapace-changes can be performed within 3 to 5 minutes, while difficult ones can last 1 hour. A new crayfish appears therefore from the old skin, complete with all possible appendages, legs, feelers, eyes, jaws, pincers etc.

Just after the change of carapace the beast takes water into its body, whereby it swells and grows in size. This size is kept until the next skin-casting. Growth thus occurs in stages and not progressively as in fishes. After about 5-7 days, the new carapace has become hard and the animal begins to live normally again. Collectors and amateur biologists can take the old skins from the aquarium and varnish them when they are dry. In this way it is possible



Skin-casting. The aperture in the cast through which the animal has emerged is denoted by the arrow

weeds (*Lemna minor* and *Lemna trivalva* respectively). Milfoils (*Myriophyllum*) and anacharis (*Elodea*) can be used advantageously as these plants produce much oxygen. But I must confess that it is not easy to obtain a good plantation in the crayfish tank for reasons we shall see further in this article. However, we can easily get rid of any trouble by using floating plants as described above. A slight aeration prevents the formation of a dust film at the surface.

The water for crayfishes must contain as much limestone as possible. Calcareous material is a necessary element for the building of the carapace. I think this should not be a problem in many regions of the British Isles. In districts where the water is soft calcareous stones can be set in the aquarium.

What do our crayfishes eat? Contrary to what some authors affirm about the river crayfish *Astacus astacus*, the two species I keep, *Astacus leptodactylus* and *Com-*

snails are broken by the jaws and eaten while the crustaceans hold them firmly between their pincers. Tubifex, insects and their larvae, and raw fish flesh are also accepted. As small fishes we can offer young goldfish, roach or guppies. Vegetable food must be provided. Especially calcareous plants are willingly consumed, such as anacharis and even stinging nettles! Plants are often rooted up. For this purpose crayfish use their large pincers as a ploughshare. They plough the soil until it has become light enough to release the plants. Then the plants are grasped by the pincers and eaten. Vertical plants which are growing in the base medium are not so easy for consumption, therefore they are uprooted. The beasts can then hold them in a more convenient position. Water snails, fish and some plants contain calcareous elements that are indispensable for the formation of the shell, as we saw above. Crayfish also take carrion, and both dead plants and animals that are already

to make a complete interesting collection that enables us to check the growth regularly, as we can provide every carapace with the date of the skin-casting. Otherwise it is possible to leave the old carapaces in the aquarium. These will be eaten up by the crayfish when they begin to take food again. The empty carapaces provide the crustaceans with chitin, which is indispensable for the formation of the new skin and contributes to its faster hardening.

On the occasion of each skin-casting, crayfishes lose their statoliths, small stones which lean on a pad of sensory cells. According to

real mating. She holds her tail folded inwards. By means of the first abdominal legs, which function as the pairing organ, the male brings sticky lumps of sperm into the genital opening of the female. However, her eggs are not laid until the next spring.

Firstly she carefully cleans the underside of her abdomen and lays herself down on her back, while she moves her tail forward. Glands on the underside of the body exude a mucus which soon covers the belly and the abdominal legs. If the female distends her tail now, a membrane of mucus will stretch out between body and caudal lobes. This mem-

brane will become hard as soon as it comes into contact with water. The eggs are laid in this perfectly isolated pouch, where they are fertilised by the sperm. When the laying of eggs is over, the female changes her posture. The eggs surrounded by mucus come into contact with the abdominal legs, to which they stick. Finally the mucous membrane is torn and the eggs hang free in the water from her legs. It looks as though they are hanging on small stalks, because the hardening mucus stretches itself under their weight.

As a rule a female lays between 200 and 400 eggs (their number should not show any too great difference in the three described species), out of which about 100 larvae hatch. These larvae reach approximately 4 mm in length. At the beginning they look rather more like big *Daphnia* than real crustaceans, because their cephalo-thorax is swollen up by the vitellus (yolk of egg) contained in their intestine. During the first days, the youngsters with the embryonal skins remain hanging to the abdominal legs of the female. There they are safe from the many dangers which threaten such small beings. They are free just after their second skin-casting. Already after the first one they are obviously like their parents, only their pincers are still very small in comparison to the remainder of the body. After the second change of carapace they climb on the back of their mother, where they remain until they feel strong enough to live independently. Rearing them is not difficult. They willingly take thread-algae, *Tubifex*, bloodworms and minced snails or earthworms.

To summarise, some practical advice. River and swamp crayfishes are suited to life in the aquarium; *Cambarus affinis* can especially be recommended because it does not grow too big and it is immune to the crayfish plague. Its colours are also by far more beautiful than those of the Galician swamp crayfish. Crayfishes are animals with few requirements. At normal room temperature they will grow very well. In winter they may stop feeding in unheated or only slightly heated rooms. They are not very selective about foods. This also is true with regard to the cleanliness of the bottom of the tank and they like to rummage in the mud for food. The base medium should consist of not too small gravel. We must offer our crayfishes many hiding-places, and the depth of water should not be too great—6 to 8 inches is enough. As crayfishes regularly hunt for prey out of the water, it is advisable to cover their tank. Slight aeration can be recommended as it will prevent the formation of a film of dust at the surface. The surface area available is a more important factor than the volume of water. Calcareous water is an indispensable element for the formation of the chitinous carapace. Crayfishes have well developed olfactory sense but they also see very distinctly and recognise their master rapidly. They quickly learn to take small fishes from the feeding-tweezers. Individual feeding can give you much pleasure. Crayfishes have no need to be fed every day; three times a week is sufficient.

Mating of the N. American river crayfish *Cambarus affinis*



the position of the animal, these stones move and press on other cells which transmit the stimulus to the central nervous system, so that the crayfish always knows in which posture it is (belly upwards, downwards or in oblique position). After having cast their old skin, *Astacus* and *Cambarus* must put new statoliths into their sensory bladder by means of their pincers and legs. Crayfish change their carapace less frequently as they become older. In the first year of their life, they can do it five to seven times, whereas adults perform this operation only once a year. The frequency of skin-casting also depends on the conditions under which the animals are kept.

The breeding of crustaceans is an equally interesting and captivating matter which can be performed successfully in the aquarium. Mating generally takes place between September and November and it happens quite otherwise than with fishes. The female is seized vigorously by the male, who tries to turn her on to her back. If he succeeds, he holds her firmly between his legs and pincers. The male can be easily distinguished by the legs of the first two abdominal segments, which are turned forward. At the beginning the female resists somewhat but she behaves quite passively during the

breeding process. She holds her tail folded inwards. By means of the first abdominal legs, which function as the pairing organ, the male brings sticky lumps of sperm into the genital opening of the female. However, her eggs are not laid until the next spring.

Firstly she carefully cleans the underside of her abdomen and lays herself down on her back, while she moves her tail forward. Glands on the underside of the body exude a mucus which soon covers the belly and the abdominal legs. If the female distends her tail now, a membrane of mucus will stretch out between body and caudal lobes. This mem-



Mr G. Beascham, Association P.R.O., writes: "The International Open Show of the FANCY GUPPY ASSOCIATION took place at the Giebe Farm Community Centre, Giebe Farm Road, Stechford, Birmingham earlier this year—"international" being the key word for this year's show as just over one-third of the entries came from overseas exhibitors. Out of a total of 693 entries put on the benches, 225 came from abroad and the remaining 468 from the various sections of the FGA, making a grand total of 1932 fish on the benches. Undoubtedly the most outstanding achievement of the day was made by Mr D. Phillimore and his wife, of the Edmonton Section, who accomplished a feat never before achieved at any International Show held by the Association by taking every major award of

the show, including Best Male, Best Female, Best Breeders, Best in Show and the Master Breeders' Trophy. In all, Mr Phillimore and his wife took 15 trophies, which must stand as a record for many years to come. Success this year too for members of the Birmingham Section who managed to send fish to the California International Guppy Show. They carried away 23 awards, which included seven firsts, six seconds, eight thirds and two fourths. Details of the FGA International '23 Open Show are already well in hand, and include a new class, which will decide the FGA World Guppy Champion, and will be held for the first time at next year's show. Remember, anyone who breeds guppies may enter all the classes at this show (except master breeders), whether they are members of the Association or not. Final details will be published as soon as possible and show schedules will be made available from the show secretary as soon as they are printed.

A RECORD number of fish was on view at the **GOLDFISH SOCIETY OF GREAT BRITAIN'S Open**

PetFish Monthly, December 1972

Show. Many friends, old and new, met and joined in the auction of very good quality fish. A new venture was a photographic section, which was well supported. The best fish in the show was a common goldfish entered by Mr A. Law. Judges Mr M. Cluse, Mr G. O'Neill, Mr L. Emery, Mr R. Easton and Mr C. A. T. Brown made the following awards:

Single fish: 1 & 2, Miss D. Morris; 3, Mr L. Barber, Vettula; 4 & 5, Mr R. Tibble; 6, Miss D. Morris, Globose-eye; 7 & 8, Mr B. Herbert, Brachydanio; 9, Miss D. Morris; 10, Mr R. Whittington; 11, Mr A. Lawson, Pterichthys; 12, Mr P. Kestell; 13, Mr T. Halpin; 14, Mrs P. Whittington, Cichlids; 15 & 16, Mr P. Kestell; 17, Mr J. Smith, Pom-pom; 18, Mr T. Halpin; 19, Mr J. Baskett, Bubbly-eye; 20 & 21, Mr S. Spoker; 22, Mr R. Mrs Bellamy, Common goldfish; 23, Mr A. Law; 24, Mr H. Brakes; 25, Mrs P. Whittington, London shubunkin; 26, 27 & 28, Mrs P. Whittington, Comet; 29, Mr & Mrs Bellamy, Fannal; 30, Mr R. Ipswich; 31 & 32, Mr B. Herbert, Oranda; 33, Mr P. Kestell; 34, Mr Cowley; 35, Mr R. Whittington, Broadtail snout; 36 & 37, Mr & Mrs Doolley; 38, Mr W. Cook.

Breeders cichlids: 1 & 2, Miss D. Morris; 3, Mr R. Whittington, Vettula; 4, Mr T. Halpin; 5, Mr S. Tibble; 6, Mr P. Kestell, Globose-eye; 7 & 8, Mr B. Herbert; 9, Mr S. Tibble, Pterichthys; 10 & 11, Mrs H. Doolley, London shubunkin; 12 & 13, Mrs P. Whittington, Fannal; 14 & 15, Mr G. Strain, Oranda; 16 & 17, Mr A. Lawson.

Record Entry at Twenty-first BAF

THE 21st BRITISH AQUARISTS FESTIVAL was a resounding success with a record gate and entry. Best fish in the show was a vellifer molly entered by Mr J. S. Hall, who also received the Withy Grove Press trophy for best tropical fish. Mr W. H. Ramsden was awarded the Challenge trophy for the best cold-water fish and Mr R. Shanks the award for best other than best fish in show (2, Mr H. Omshar; 3, Mr W. H. Ramsden). The Champions of Champions Competition was won by a lemon fin barb entered by Mr & Mrs Bird (90 points) (2, Mr A. Kinsey, 81; 3, Mr R. Henry, 81). The award for the best Society stand went to Belle Vue AS with Haringstone & DAS coming second and Northwich AS third. Mr W. H. Ramsden was the competitor gaining most awards (John East Memorial Challenge trophy). The Northern Goldfish & Pond Society won the special prize as the Society whose members won the most points for its four highest pointed awards, and the Roses Shield for the Lancashire v. Yorkshire Inter-Society Competition was won by Lancashire.

Challenge trophy, best Society furnished aquaria: 1, Northwich, 71; 2, Valley, 61; 3, Aston-on-Trent, 54; 4, B. (1, Bury, 72; 2, Accrington, 17; 3, Ormskirk, 22; 4, Walker South

Chorlton Shield, best individual furnished aquaria (topical): 1, Mr L. Dowley, 56; 2, Mr A. Vassier, 61; 3, Miss W. Kemp, 51. **Hammock trophy, best individual furnished aquaria (coldwater):** 1, Mr B. Gledhill, 44; 2, Mr H. Smith, 61; 3, Mr M. J. Goodfield, 60. **Challenge trophy, best Aquarist:** 1, Miss O. M. Matthews, 28; 2, Mr N. Jackson, 71; 3, Mr H. Peshall, 69. **Society Aquarist:** 1, Miss L. Strang, 50; 2, Mr J. Bentley, 70; 3, Mr E. Sepponen, 78. **Challenge trophy, common goldfish and variety:** 1, Mr W. H. Ramsden, 79; 2, Mrs O. M. Matthews, 77; 3, Mrs Susan Brantley, 66. **Challenge trophy, shubunkin:** 1, Mr B. Rothwell, 68; 2, Mr R. M. Boothwell, 53; 3, Mr H. Peshall, 54. **Nottingham Shield, money:** 1, Mr B. M. Rothwell, 68; 2 & 3, Mr W. H. Ramsden, 67, 66. **Walker South challenge trophy, veils:** 1, 2 & 3, Mr W. H. Ramsden, 68, 67, 66. **Chorlton Shield for a.s.s. fancy goldfish etc.:** 1, Mr H. Peshall, 70; 2, Mr J. S. Hall, 70; 3, Mr C. Whitney. **Darby Shield, a.s. coldwater fish other than classed a.s.s.:** 1, Mr W. H. Ramsden, 78; 2, Mr E. Peshall, 69; 3, Mr C. H. Whalley, 66. **Guppy a.s. single fish:** 1, 2 & 3, Mr R. D. Lacroix, 64, 62, 61. **Challenge trophy, guppy pairs:** 1, Mr H. Hoekens, 63; 2, Mr A. Charlton, 62; 3, Mr R. Young, 49. **Liverpool a.s.s. single fish:** 1 & 2, Mr J. S. Hall, 86, 74; 3, Mr H. Hubbard, 71. **Challenge Cup, pairs:** 1, Mr H. Ormskirk, 70; 2, Mr & Mrs Baxter, 70; 3, Mr H. Leadbeter. **Angels a.s. single fish:** 1 & 2, Mrs S. Brantley, 72, 71; 3, Mr J. Bousfield, 70. **Challenge Cup, pairs a.s.s.:** 1, Mr J. Healy, 73; 2, G.R.A. Jackson, 69; 3, Mr Wild, 63. **Dorset cichlids single fish:** 1, Mr H. Ormskirk, 72; 2, Mr T. Brook, 77; 3, Mr L. Prosser, 74. **Lancashire trophy for clearest cichlid pairs:** 1, Mr O. Highy, 71; 2, Mr B. Bassett, 74; 3, Mr J. Lear, 68. **Goldfish a.s.s. single fish:** 1, Mr L. Bousfield, 74; 2, Mr H. Ormskirk, 75; 3, Mr J. A. Whalley, 72. **Challenge Cup for cichlids a.s.s.:** 1 & 2, Mr H. Charlton, 71, 67; 3, Mr and Mrs Reid, 56.

Challenge trophy, fishless: 1, Mr J. Harry, 74; 2, Mr M. D. Barr, 71; 3, Mr and Mrs Yarns, 67. **Guinness a.s. and special single fish:** 1, Mr D. Niddry; 2, Mr M. Strang, 71; 3, Mr C. Niddry, 74. **Challenge trophy for a.s.s. a.s. and special pairs:** 1, Mr S. A. Hunt, 75; 2, G.R.A. Jackson, 68; 3, Mr S. Axtor, 66. **Burton a.s. single fish:** 1, Mr R. Cliff, 70; 2, Mr F. Gregory, 78; 3, Mr R. Parker, 74. **Challenge trophy, barb a.s. pairs:** 1, Mr C. Beckwith, 80; 2, Mr F. Gregory, 72; 3, Mr R. Stafford, 76. **Chorlton a.s.s. single fish:** 1, Mrs B. Strang, 70; 2, Mr B. Wilson, 29; 3, Mr R. Grange, 26. **Challenge Cup for champion pairs:** 1, Mr R. Shanks, 81; 2, Mr L. Bennett, 74; 3, Mr H. Ormskirk, 74. **Cornwall minimum a.s. single fish:** 1, H. & R. McKenna, 70; 2, Miss J. Galliano, 79; 3, Mr J. Dawson, 77. **Warwick trophy, carp and minnow a.s. pairs:** 1, Mr A. Moss, 78; 2, Mr S. A. Hunt, 74; 3, Mr R. Johnston, 58. **Catfish a.s. single fish:** 1, Mr D. Charlton, 74; 2, Mr J. Pargett, 72; 3, Mr J. S. Hall, 68. **York trophy for cichlids a.s. pairs:** 1, Mr R. Davies, 71; 2, Mr D. Lamson, 74; 3, Mr P. Kayson, 68. **Eggs/young trophy a.s. single fish:** 1, Mr J. Roberts, 70; 2 & 3, Thorne & O'Brien, 74, 73; 4 & 5, Mr R. Furness, 70, 69, 67. **Darham trophy, loach a.s.s.:** 1, Mr F. R. Falah, 74; 2, Mr Weyall, 71; 3, H. & P. Birtchall. **Rose Bowl for a.s. other than common a.s.s.:** 1, D. & R. Strang, 71; 2, H. & C. Birtchall, 81; 3, Mr M. Trueman, 68. **Challenge trophy, broadtail a.s.s. pairs:** 1, Mr E. Sharr, 70; 2, Mr D. Charlton, 71; 3, Mr A. P. Vassier, 74. **Challenge trophy, broadtail veils:** 1, Mr R. Young, 70; 2, Mr L. Thorne, 71; 3, Mrs P. Young, 68. **Challenge trophy, broadtail coldwater:** 1, Mr R. M. Rothwell, 74; 2, Mr W. H. Ramsden, 72; 3, Mr J. S. Hall, 66. **Challenge trophy for pairs a.s.s.:** 1, Mr A. Reeder, 72; 2, Mrs Susan Brantley, 74; 3, Mr J. Harry, 70. **Challenge trophy, best marine furnished aquaria:** 1, Mr H. Ormskirk, 61; 2, Mr H. Feldman, 60; 3, Mr A. Ashon, 58.

In Brief . . .

BURY & DAS AGM marked the 25th anniversary of the formation of the Society and, befitting the occasion, there was a more than usual festive air about the proceedings. The table show attracted 28 entries, which, considering the two main classes were for pairs and breeders teams, promises well for the Society's continued policy of encouraging members to breed and rear their own fish. The Wendle trophy, for the highest number of points gained during the year, went to Mr & Mrs A. Beeson and other trophies, won evenly by month throughout the year, were also presented. A 7000 word history covering the 25 years has been compiled and produced entirely from the Society's own resources and a copy was presented to each member. Copies will also be sent out to neighbouring societies in due course.

THE interesting lecture given to members of **NORTHWICH & DAS** by Mr R. Young with the slide show presented by Dr A. Clarke, both of the Manchester section of the FGA, L. & D. Thorne had an extremely successful evening in the table show winning in the classes for both large and small cichlids, the trophy for the fish of the month and the breeders egg-layer classes.

FREELANCE AS were very grateful to Mr S. Cowell for judging their recent inter-club a.v. catfish show. Results: 1, Mr W. Sutton; 2, Mr E. Stainer; 3, Mr J. Stamp. This turned out to be a great success for new members. Thanks are also due to Mr Cowell for

giving a very interesting talk called 'Birth to Show'. The club also held a Sunday outing to two leading fish farms which proved of great help and interest to new members as they were able to see so many different varieties of fish.

A NEW aquarists' society has been formed in Shrewsbury—the **SEVERN SIDE ICHTHYOLOGICAL SOCIETY**. Meetings are held on alternate Fridays (December 1st, 15th) in the Labour Club, Abbeyforegate, Shrewsbury, 8.00 p.m. There have already been lectures on marines, barbs, Malawi cichlids and judging, and a trip to the BAF. Anyone wishing to join will be made welcome. For further information contact secretary Mr M. S. Pinches, 3 St Julians Friars, Shrewsbury.

GLOUCESTER Fishkeepers,

FURTHER details of the Grand Aquarist Seminar planned by Derby Regent AS for Sunday, 14th January 1973 at the Derby Playhouse, Sackville Street, Derby, may reach us. A whole day of talks, 16 mm films and other features are planned to provide a feast for aquarists. There will be lectures commencing at 10.15 a.m. from Dr J. N. Carrington of Interpet, Mr Graham Cox of ScAquarists and Mr Roy Shipper of the House of Fishes. To help those who have a long way to travel, the film 'The Fish Embryo' will be shown until the first lecture at 10.15 a.m. Lunch break will be from 12.15 to 2.0 p.m. and refreshments and buffet lunch will be available at reasonable prices. Tickets, price 50p each, from Mr J. Bland, 3 Cumberhill Road, Duffield, Derby DE6 4HA. The Society feel that the occasion is not suitable for children and children under 14 years of age will not be admitted.

Stroud, West Gloucester, Gloucester Aquarists, Worcester and Hereford Societies all took part in the six-a-side competition held by **BISHOPS CLEEVE AS**. Winners were Bishops Cleeve with 877½ points (2, West Glos., 866½; 3, Hereford, 864½). Judges Mr Littleton and Mr Parsons gave the best egg-layer overall award to Mr McMillan (West Glos.) and the best livebearer to Mr Rossiter (Glos. Aquarist), both with 84 points.

HAVANT & DAS have much enjoyed recent talks on successful discus breeding and on biological filtration, given by Mr Frank Willis and Mr John Lamboll respectively, which have been most informative.

AT WREXHAM TROPICAL FISH SOCIETY'S AGM a talk and demonstration on furnished jars was given by Mrs V. Oliver followed by slides taken by members of the Society. Meetings are held on the second and last Thursday of the month at The Fellowship Hall, Bradley Road, Wrexham, and all are welcome.

WHEN LLANTWIT MAJOR AS held their annual dinner the chairman, Mr R. S. Wigg, presided and among the 35 guests and members present were the club's president Alderman P. J. Smith C.B.E., and representatives from Barry, Cardiff and Newport societies. Presentations of the evening made by Alderman Smith included the Wing Commander Smith Cup to the member of the year, Mr J. Thompson; the J. Holmes Memorial Cup for breeders egg-layers to Mr A. Ibbotson; the Miles Thomas Cup for the most points of the year to Master Paul Glover; the Stangton Cup for best fish in the September show to Mr Paul Glover; the President's Cup for breeders livebearer to Mr R. S. Wigg.

Meetings and Changes of Officers

ALFRETON & DAS, President, Mr S. Towler; treasurer, Mr S. Dooly; secretary, Mr S. Hill (33 South Street, Reddings, Duffield, DE6 4ED); chairman, Mr M. Fenton; show secretary, Mr R. Hocking.

SULTON TROPICAL FISH CLUB, New secretary, Mr N. Barlow (76, Monington Road, Sulton, BL4 4EP).

BRACKNELL AS, President and vice-president, Ann and Joyce Roberts; chairman, Mr Len Little; vice-chairman, Mr George Warwick; secretary, Mr Tony Clouston (14 The Larches, Warfield Park, Bracknell, phone Warfield How 4995); treasurer, Mr Ken Phillips; show secretary, Mr John Harvey. Meetings: 2nd and 4th Monday in month, The Admiral Cunningham Hotel, Bracknell. New members welcome.

BURY & DAS, Chairman, Mr H. Cooper; secretary, Mr D. Molinson (1, Southfield Rd, Holbrook Brooks, Barnhampton BL9 5ST); treasurer, Mr T. Handman.

HAVANT & DAS, New venue, St. Thomas's Church Hall, Belmont Green, Havant, New Street, Wednesday fortnightly.

HUCKNALL & BULWELL AS, President, Mr E. Smith; chairman, Mrs Sandilife; vice-chairman, Mr M. Harrington; secretary, Mrs B. Richardson (11, Newlyn Drive, Western Blvd., Nottingham, NG9 1GU); treasurer, Mr G. Swaswick (show secretary, Mr Sandilife; assistant, Mr P. Simpson; fund raiser, Mr E. Kirk; social secretary, Mr B. Blazwick); illustrators, Mr J. Bush.

LLANTWIT MAJOR AS, Meetings: the 2nd Tuesday of month at the Town Hall, Llantwit, 7.30 p.m. New members always welcome.

NORTH STAFFS. AS, New secretary, Mr N. Adams, 4 Castle St., Chatterton (phone 722 25492).

NORTHWICH & DAS, Meetings: The Winnington & Castle Old Friends Club, Barbara Lane, off Queensgate Castle, Northwich.

READING & DAS, Chairman, Mr A. Gibson; assistant, Mr F. Rushbrook; secretary, Mr S. R. Beeson (49 Calbeck Drive, Wootley, Berks, RG5 4LA); treasurer, Mr E. Sedman; fish steward, Mr G. Hamblen.

WREXHAM TROPICAL FISH SOCIETY, Chairman, Mr J. M. D'Arcy; secretary, Mr C. Pritchard (Creggish, Middle Rd, Nant Condroeth, nr Wrexham); treasurer, Mrs V. Oliver; illustrators, Mr G. Jones. Meetings held the 2nd and last Thursday of month, the Fellowship Hall, Bradley Rd, Wrexham.

UXBRIDGE & DAS, Chairman, Mr J. Evans; secretary, Mr B. Whitehead (12 Barbara Walk, West Drayton); show secretary, Mrs S. Whitehead; treasurer, Mr N. V. Lee.

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... DR Peter Bottomley gave a talk, illustrated by slides, on the work of the Pollution Control and Fisheries Department entitled 'Conservation of Water Quality' to members of **DERBY REGENT AS** at their October meeting, which was greatly enjoyed by both members and friends.

... **UXBRIDGE & DAS** have enjoyed a very successful year both in open shows and inter-club competitions. The proposal to find new club premises caused a lively discussion at the AGM and it was finally agreed to look for a hall with better facilities. Principal prizewinners in the club competitions were: Mr D. Parsons, best fish of the year award; Mr R. Newman, highest points and breeders egglayers; Mr J. Parker, breeders livebearers; Mr H. Thompson, pairs; K. Pettit, Junior; home furnished aquaria, Mr K. Wilton.

... MANY questions were asked and answered when Mr J. Hemmingway of Batley gave a talk on general fishkeeping to **PRIVATEERS AS**. The speaker's deep knowledge of the subject was very evident and it proved to be a thoroughly enjoyable evening for everyone.

... ANSWERING a question on gill flukes from a member of **BRISTOL AS**, Mr Ted Newman

UXBRIDGE & DAS are holding their annual dance and social at the GPO Motor Workshops Sports & Social Club, Willowtree Lane, Yeading, Hayes, Middlesex on 8th December from 8.00 to midnight. Tickets (£1 per person) include chicken supper and lucky ticket draw and may be obtained from Mr N. V. Lee, 46 Airedale Road, Ealing, London, W5 4SD.

claimed that three drops of a 5% acriflavine solution in 12 gallons of water for 3 or 4 days often proved effective. The speaker named angel

fish as his personal favourite because of their intelligence and the parental care they undertook in rearing their young.

Dates for Your Diary

27th December. **HORSFORTH AS** Open Show, New Civic Hall, Bradford Road, Stanningley, Pudsey. Schedules: Miss J. Helm, 29 Wellington Road, New Wortley, Leeds 12; phone Leeds 21025.

1973

Note your special dates in the PFM Aquarist's Pocket Diary 1973, now available (40p post free from PFM, 554 Garratt Lane, London SW17 6NY).

14th January. **DERBY REGENT AQUARIST SEMINAR**. Playhouse Theatre, Derby. Speakers include Dr N. Carrington, Mr Graham Cox and Mr Roy Skipper. Tickets (60p) from Mr J. Harrel, 5 Cumberhills Road, Duffield, Derby DE6 4HA; phone Derby 541135.

18th February. **ROTHERHAM & DAS** 4th Open Show, Brinsworth Manor School, Brinsworth Lane, Brinsworth. Details: Mrs J. Aitton, 6 Bent Lathes Avenue, Rotherham, Yorks S60 4BL.

24th March. **NELSON AS** Open Show, Civic Centre, Stanley Street, Nelson, Lancs.

1st April. **HOUGHTON & DAS** Open Show. Details later.

8th April. **WARRINGTON AS** Open Show (FNAS Rules). Venue later. Show secretary: Mr J. Higham, 42 Hood Lane, Sackey, Warrington, Lancs; phone 36930.

14th April. **INDEPENDENT AS** Open Show, The Public Hall, Islington Town Hall, Upper Street, Islington, London, N1.

15th April. **COVENTRY POOL & AS** Open Show, Foleshill Community Centre, Foleshill Road (444), Coventry. Details: Mr S. Woodbridge, 32 Ridgeway Avenue, Styrechale, Coventry or Mr D. J. Grant, 22 Cecily Road, Chylesmore, Coventry.

21st April. **RUNNYMEDE AS** Open Show. Details later.

6th May. **OSRAM AS** Open Show, Osram Recreation Hall, Refuge Street, Shaw, Oldham, Lancs.

13th May. **GLOUCESTER AS** 2nd Open Show, Gloucester Education and Leisure Centre, Painswick Road, Gloucester. Schedules: Mr M. Brooks, 114 Melbourne Street, Gloucester from February on.

13th May. **CROYDON AS** Open Show.

13th May. **CORBRY & DAS** Open Show, Corby Civic Centre, FBAS rules. Details later.

13th May. **DERBY REGENT AS** Open Show, Sherwood Foresters Recreation Centre (Normanton Barracks), Osmaston Road (A5111) Derby, RAC signposted. Show secretary: Mr R. G. Harlow, 189 Mansfield Road, Derby; phone 44322.

19th May. **SOUTHEND, LEIGH & DAS** Open Show, St Clements Hall, Rectory Grove, Leigh-on-Sea. Schedules from Mr D. C. M. Durrant, 172 Trinity Road, Southend-on-Sea, Essex; phone Southend 610576.

20th May. **MERSEYSIDE AS** Open Show, British Legion Hall, Crammond Avenue, Liverpool. Details: Mr Brian Hall, 121A Roughedge Hey, Central Fram, Liverpool L28.

20th May. **YEovil & DAS** Open Show, The School Hall, Church Street, Martock, nr Yeovil. Details later.

27th May. **WEYMOUTH AS** Open Show. Details later.

9th June. **LLANTWIT MAJOR AS** Open Show. Show secretary: Mr J. Edwards, Glanafon Mill Park, Llanblethian, Cowbridge Glam.

10th June. **LINCOLN & DAS** Open Show. Details later.

17th June. **SWILLINGTON AS** Open Show, John Smeatons School, off Barwick Road, Leeds 14. Show secretary: Mr K. Stanley, 25 Goodwood Avenue, Kippax, nr Leeds, Yorks.

12th August. **NORTH STAFFS AS** Open Show. Details later.

9th September. **NUNEATON AS** Open Show. Details later.

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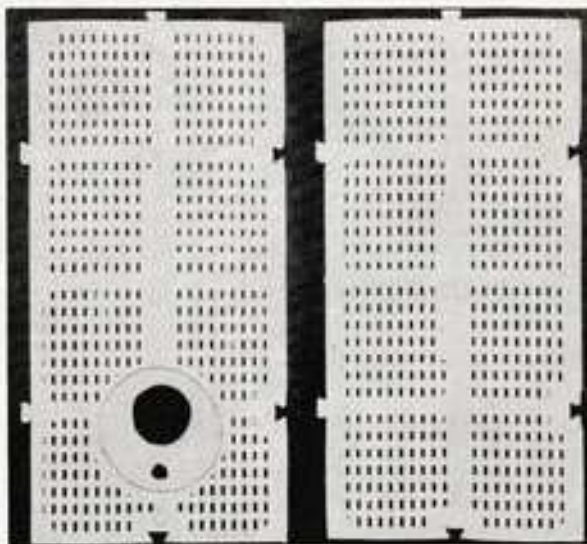
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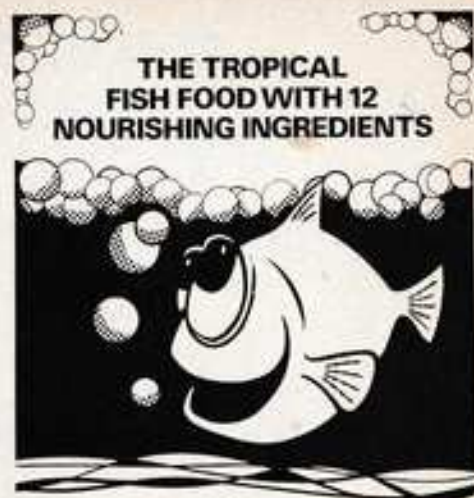
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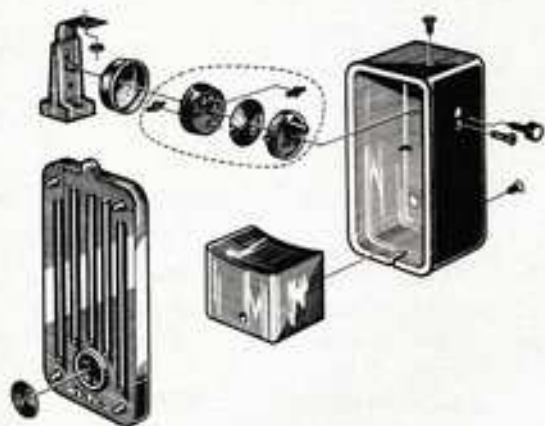
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