PHILLIPS
The finest fish food

For Tropicals and Cold-water Fish. Two balanced, scientifically blended and nourishing foods.

Extra high in protein and rich in vitamins and minerals. Phillips Fish Foods contain dried shrimp, daphnia, meat meal, white fish meal, alfalfa, milk powder, cod-liver oil, wheaten cereal and yeast—scientifically blended for balanced nutrition. Always buy Phillips, the Fish Food you can trust.

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Fine grade for Tropicals 1/8

*Phillips Cold-water Fish Food contains SAPROLEGNIL to protect against the ravages of 'cotton wool' fungus.

Phillips Yeast Products Limited,

M. & R. (DOG-FISH) LTD.
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Marine Tropicals, plus the usual large varieties of tropical fish.
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WEBB'S
AQUARIAS
WHOLESALE AND RETAIL
FRESHWATER—MARINE
SEE OUR SELECTION OF QUALITY FISH AT COMPETITIVE PRICES.

27 WEBB'S ROAD LONDON, S.W.11
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WATER GARDEN

Be sure it's safe for children and pets:
ONLY the STOKES GOLIATH PUMP

gives the power to operate at least 3 features on an absolutely safe 50 V.
It costs a little more than some but more than worth the extra.
£12.10.6 complete with Transformer and ready to fit.

Write for FREE leaflet showing how to build a water garden complete with Fountains, Cascades etc:

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139B Croydon Road Caterham Surrey
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WHAT ALL BREEDERS HAVE BEEN WAITING FOR!

INTRODUCING . . . . .

LARGE SIZE LIQUIFRY

60 mls for 4/6

This unique liquid contains (a) particles of immediate food value to the fish; and (b) substances to produce natural infusoria in the minimum possible time. The product is in liquid form to ensure the correct particle size and to give rapid dispersion throughout the tank with minimum disturbance to the delicate fry.

Mr. A. Boarder,
well-known writer on aquatic topics and show judge, says:

"I have started my goldfish on nothing else but Liquifry since it first came on the market. I would not be without Liquifry and never use infusoria now."

LIQUIFRY No. 1 for fry of Egglayers
LIQUIFRY No. 2 for young Livebearers

STANDARD SIZE 2/6d PER TUBE.
NEW LARGE SIZE 4/6d. (BOTTLE)

INTER-PET SALES DIVISION OF LIQUIFRY CO. LTD.
CHURCH STREET - DORKING - SURREY

START YOUR BABY FISH ON LIQUIFRY AND WATCH THEM GROW!

April, 1968
QUALITY AQUARIUM PLANTS

The following selection of plants is available at the time of going to press and orders for these will be executed promptly, subject to stocks still being available on receipt of your order. Orders received on Thursdays or later, before a week end, are held for despatch until early the next week in order to minimise the risk of their being held up too long in the post. Substitutes may be suggested and this would help us in completing your order. All plants are gathered fresh straight from our plant house and posted the same day to ensure that they arrive in the best condition.

<table>
<thead>
<tr>
<th>ENGLISH GROWN PLANTS</th>
<th></th>
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<tbody>
<tr>
<td>Vallisneria Torta</td>
<td>per each</td>
<td>6d.</td>
</tr>
<tr>
<td>Vallisneria Spiralis</td>
<td></td>
<td>6d.</td>
</tr>
<tr>
<td>Sagittaria Natans</td>
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<td>6d.</td>
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<tr>
<td>Ambulia</td>
<td></td>
<td>10d.</td>
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<tr>
<td>Bacopa Monniera</td>
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<td>6d.</td>
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<tr>
<td>Hygrophila Polysperma</td>
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<td>6d.</td>
</tr>
<tr>
<td>Ludwigia Mullertii</td>
<td></td>
<td>6d.</td>
</tr>
<tr>
<td>Aponogetons</td>
<td></td>
<td>2/0</td>
</tr>
<tr>
<td>Water Wistaria</td>
<td></td>
<td>1/9</td>
</tr>
<tr>
<td>Indian Ferns</td>
<td></td>
<td>1/9</td>
</tr>
<tr>
<td>Dwarf Lilies</td>
<td></td>
<td>1/9</td>
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<table>
<thead>
<tr>
<th>IMPORTED PLANTS, (Acclimatised)</th>
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<tbody>
<tr>
<td>Amazon Swords</td>
<td>per each</td>
<td>4/6</td>
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<tr>
<td>Malayan Swords</td>
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<td>1/9</td>
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<tr>
<td>Red Cabomba</td>
<td></td>
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</tr>
<tr>
<td>Green Cabomba</td>
<td></td>
<td>1/0</td>
</tr>
<tr>
<td>Cryptocoryne Bullosa</td>
<td></td>
<td>5/0</td>
</tr>
<tr>
<td>Cryptocoryne Ciliata</td>
<td></td>
<td>1/9</td>
</tr>
<tr>
<td>Red Hygrohila</td>
<td>per each</td>
<td>1/0</td>
</tr>
<tr>
<td>Borneo Ferns, 3in.</td>
<td></td>
<td>2/6</td>
</tr>
<tr>
<td>Egeria Densa</td>
<td></td>
<td>6d.</td>
</tr>
<tr>
<td>Water Rose</td>
<td></td>
<td>1/0</td>
</tr>
<tr>
<td>Cryptocoryne Cordata</td>
<td></td>
<td>1/9</td>
</tr>
<tr>
<td>Cardamine</td>
<td></td>
<td>1/0</td>
</tr>
</tbody>
</table>

Postage and Packing 2/6 extra on all orders please. S.A.E. with all enquiries.

Retail shop: 188, Cowley Road, Oxford. (Tel. Oxford 41825)
Wholesale: 9, East Avenue, Oxford. (Tel. Oxford 41825)
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Ask your stockist for our FREE Feeding, Care and Temperature Tables, or send self-addressed, stamped envelope to:
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April, 1968
Hykro from Denmark

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All these foods are stocked by all good Aquarist and Pet Shops and price is very reasonable for real quality food.

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And now the Sensational Variety Food 3/-.
P. H. Indicator. Gives over 100 water tests instantaneously, no mixing no trouble, 5/6 each.

JOE GRASSBY
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may be the answer to your problem

USED BY THE LEADING CONTINENTAL AQUARISTS

* For quarantining newly acquired fish and animals
* General tonic for the marine aquaria
* Plant stimulant and tonic for the freshwater aquarium

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New
THE MOST EXCITING RANGE OF BOOKS* FOR AQUARIUM ENTHUSIASTS IN FULL COLOUR

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SALTWATER AQUARIUM

know how to
BREED TROPICAL FISH

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• Enjoy Your Barbs
• Enjoy Breeding Egglayers
• Enjoy Breeding Livebearers
• Enjoy Your Catfish
• Enjoy Your Cichlids
• Enjoy Your Discus
• Enjoy Your Fighting Fish from Siam
• Enjoy Your Goldfish
• Enjoy Your Gouramis and Other Anabantids
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• Enjoy Your Guppies
• Enjoy Your Killifish
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• Enjoy Your Platys and Swordtails
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• Enjoy Your Tetras
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• Know How To Breed Tropical Fish
• Know How To Breed Egglayers
• Know How To Breed Livebearers
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• Know Your Guppies
• Know How To Keep Salt Water Fishes

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April, 1968
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1. Grilled top, base and interior partitions allow water flow and movement of fry.
2. Easy-fit interior fry separators can be positioned if required.
4. Provision for internal aeration to encourage water flow through the trap.
5. Fixed base provides exit for fry but not of adult.
6. Legs on which trap can stand on the bottom of a tank, or rubber suckers by which trap can be adhered to the side of tank.
7. Upper compartment divider enables two adults to be accommodated or can be used to limit movement of a single female.

Price 19/6

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**RAYNER’S TROPICALS**  
(LONDON)  
Established 1949  
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Member F.T.A.

You MUST see our display of Fish and Plants in the most original setting—ANYWHERE!  
All Fish sold are FULLY quarantined. We have ninety quarantine tanks, plus sixty sparkling show tanks.

### OFFERS

<table>
<thead>
<tr>
<th>Fish</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kohi Loaches</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Glowlighths</td>
<td>3/1 - 3/6 Each</td>
</tr>
<tr>
<td>Harlequins</td>
<td>2/1 - 2/6 Each</td>
</tr>
<tr>
<td>Penguins</td>
<td>3/6 - 3/6 Each</td>
</tr>
<tr>
<td>White Clouds</td>
<td>3/1 - 3/6 Each</td>
</tr>
<tr>
<td>Zebra</td>
<td>2/1 - 3/6 Each</td>
</tr>
<tr>
<td>Black Widows</td>
<td>2/1 - 2/6 Each</td>
</tr>
<tr>
<td>Lailon Tears</td>
<td>1/6 - 2/6 Each</td>
</tr>
<tr>
<td>Jack Demers</td>
<td>2/1 - 2/6 Each</td>
</tr>
<tr>
<td>Bumble Bees</td>
<td>2/1 - 3/6 Each</td>
</tr>
<tr>
<td>Cardinals</td>
<td>3/6 - 2/6 Each</td>
</tr>
<tr>
<td>Small Tiger</td>
<td>4/1 - 3/6 Each</td>
</tr>
<tr>
<td>Barbs</td>
<td>3/3 - 3/6 Each</td>
</tr>
<tr>
<td>Flames</td>
<td>3/4 - 3/6 Each</td>
</tr>
</tbody>
</table>

**SPECIAL FISH**

<table>
<thead>
<tr>
<th>Fish</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clown Barbs</td>
<td>6/6 Each</td>
</tr>
<tr>
<td>Lobordei Lusos</td>
<td>8/6 Each</td>
</tr>
<tr>
<td>Elephantidos Pecos</td>
<td>8/6 Each</td>
</tr>
<tr>
<td>Giant Danios</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Nemastomus Lobos</td>
<td>5/6 Each</td>
</tr>
<tr>
<td>Cherry Barbs</td>
<td>2/6 Each</td>
</tr>
<tr>
<td>Electric Specials</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Comb Tail 21</td>
<td>2/6 Each</td>
</tr>
<tr>
<td>Palmis Kribidos</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Tiger Sharks</td>
<td>3/6 - 4/6 Each</td>
</tr>
<tr>
<td>Seven Star Barbs</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Large Orange Dorsal Mollies</td>
<td>16/6 Each</td>
</tr>
<tr>
<td>Dwarf Gouramis</td>
<td>8/6 Each</td>
</tr>
<tr>
<td>Clow Loaches</td>
<td>2/6 Each</td>
</tr>
<tr>
<td>Pink Kissing Gouramis</td>
<td>20/6 Each</td>
</tr>
<tr>
<td>Large Armoured Cat Fish</td>
<td>25/6 Each</td>
</tr>
<tr>
<td>Emperor Tassus</td>
<td>15/6 Each</td>
</tr>
<tr>
<td>Porases 2</td>
<td>15/6 Each</td>
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</tbody>
</table>

### TOOTH CARPS

<table>
<thead>
<tr>
<th>Fish</th>
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<tbody>
<tr>
<td>Ash. Australis</td>
<td>12/6 Each</td>
</tr>
<tr>
<td>Ash. Vestilier</td>
<td>12/6 Each</td>
</tr>
<tr>
<td>Ash. Spotelli</td>
<td>12/6 Each</td>
</tr>
<tr>
<td>Ash. Bercei</td>
<td>12/6 Each</td>
</tr>
<tr>
<td>Pachychilus Orfe</td>
<td>12/6 Each</td>
</tr>
<tr>
<td>Pachychilus Mayori</td>
<td>8/6 Each</td>
</tr>
<tr>
<td>Cynodon Whitefish</td>
<td>25/6 Each</td>
</tr>
<tr>
<td>Cynodon Nigrospinous</td>
<td>25/6 Each</td>
</tr>
</tbody>
</table>

Other varieties available soon.

### GENERAL LIST

<table>
<thead>
<tr>
<th>Fish</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Silver Hackels</td>
<td>7/6 Each</td>
</tr>
<tr>
<td>Marble Hackels</td>
<td>6/6 Each</td>
</tr>
<tr>
<td>Black Angles</td>
<td>7/6 Each</td>
</tr>
<tr>
<td>Silver Angles</td>
<td>7/6 Each</td>
</tr>
<tr>
<td>Red Swords</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Red Tusao Swords</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Green Swords</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Moon Plaice</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Red Wagtail Plates</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Red Wagtail Plates</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Yellow Wagtail Plates</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Black Mollies Small</td>
<td>2/6 Each</td>
</tr>
<tr>
<td>Black Mollies Medium</td>
<td>2/6 Each</td>
</tr>
<tr>
<td>Snakeskin Guppies</td>
<td>5/6 Each</td>
</tr>
<tr>
<td>Common Guppies</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Australian Raintos</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Firemouths</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Keyhole Cichlids</td>
<td>16/6 Each</td>
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<tr>
<td>Giant Gouramis</td>
<td>6/6 Each</td>
</tr>
<tr>
<td>Blue Gouramis</td>
<td>3/6 Each</td>
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<tr>
<td>Thick Lip Gouramis</td>
<td>3/6 Each</td>
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<tr>
<td>Olive Lip Gouramis</td>
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<tr>
<td>Apoas Ramirezi</td>
<td>9/6 Each</td>
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<tr>
<td>Red Eye Terra Large</td>
<td>6/6 Each</td>
</tr>
<tr>
<td>Scissurosts</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Pearl Danios</td>
<td>3/6 Each</td>
</tr>
<tr>
<td>Amonymeri Large</td>
<td>3/9 Each</td>
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<tr>
<td>Silver Shasks</td>
<td>27/6 Each</td>
</tr>
<tr>
<td>Brown Acoras</td>
<td>3/6 Each</td>
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<tr>
<td>Brown Acoras Large</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Serpent Good Size</td>
<td>4/6 Each</td>
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<tr>
<td>Black Lace Veil Tail Angelfish</td>
<td>2/6 Each</td>
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<tr>
<td>Green Lace Tail Mollies</td>
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<tr>
<td>Glass Fish</td>
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<tr>
<td>American Flag Fish</td>
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<tr>
<td>Lampetys</td>
<td>2/6 Each</td>
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<tr>
<td>Convexus Cichlids</td>
<td>2/6 Each</td>
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<tr>
<td>Nannostomus Tribolostiatus</td>
<td>6/6 Each</td>
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<tr>
<td>Spanker Barbs</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Madagasar Rainbow</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Mosquito Fish</td>
<td>4/6 Each</td>
</tr>
<tr>
<td>Blood Red Plaices</td>
<td>4/6 Each</td>
</tr>
</tbody>
</table>

### PLANTS AND BULBS

- **Apon. Crinops 1/3 or 3/3**  
- **Apon. Undulatopinna 1/3 or 3/3**  
- **Apon. Dixanthus 1/3 or 3/3**  
- **Nym. Stellata 1/4 or 3/3**  
- **Crypt. Naisilla 1/4 Each**  
- **Bankeelia 4/6 Each**  
- **Clivia 10/6 Each**  
- **Vallis – Sagittaria – Cosmopolis**  
- **Ambulocystis – Balbisia – Bocopa**  
- **Densa – All 1/6 Each**  
- **Wisteria 1/6 Each**  
- **Japanese Rush 4/6 Each**  
- **Indian Fern (large) 3/6 Each**  
- **Our own special Red Ludwigia 1/6 Each**  
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---

**RAYNER’S FANTASTIC GRAVEL:** Blue, Red, Green, Yellow, Black, White 1/4-1lb.  
Rock, Beautiful Slate, Black Devon, Red Mendip, Westmorland.  
Very large stock of Tanks, Stands and Hoods.  
ALL ACCESSORIES.

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Over fifty varieties of aquatic plants including WATER LILIES, DEEP WATER AQUATICS AND MARGINALS are now ready for lifting. Our catalogue “Water Gardening,” which gives accurate descriptions of all the plants in stock, together with a useful guide to planting and stocking the pool with fish, is available free on application.

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Be guided by
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IS THERE A FINER SELECTION OF
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COLDWATER FISHES IN ENGLAND?

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ARE UNBEATABLE

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CABLES: CHISAQUA, LONDON, W.4
TELEPHONE: 01-994 6549

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BIRDS, BIRDCAGES.
EXHIBITIONS AND
INSTALLATIONS.

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and starter units

WHOLESALE ORDERS EXECUTED IMMEDIATELY

Satisfaction Guaranteed

April, 1968
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THE COMPLETE POWER FILTER SYSTEM

NOW IN 4 SIZES

388 "Compact" for aquariums up to 100 ltrs.

386 "Singel" for aquariums up to 200 ltrs.

486 "Super" for aquariums up to 500 ltrs.

586 "Powermaster" for the very large aquarium. Output 1,000 ltrs per hour.

All units supplied complete with "Suresynth" fresh or sea water medium. Fully guaranteed for 1 year, available from all good aquarium shops.

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OLD BATH ROAD COLN BROOK SLOUGH BUCKS
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Then visit the KEITH BARRACLOUGH
WATER GARDENING DEPARTMENT

Here you will see extensive stocks of fish, plants and
ALL necessary equipment and material.
And a SPECIAL DISPLAY OF UNDERWATER
ILLUMINATIONS, WATER FOUNTAINS, etc.
Or, if you cannot get along to see us, complete the coupon
at the foot of this page and we will send you our list.

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GARDEN PUMP
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Controlling algae

by B. Whiteside

The problem of algae in the aquarium is one which faces the aquarist sooner or later. The usual answer to the problem is to adjust the light which enters the aquarium, or to use one of the available aquarium algae-killers. Both of these methods are certainly effective but the latter is rather expensive over a period if one keeps several aquaria.

The problem arose recently in one of two aquaria which decorate the entrance hall of a large secondary school. One of the two tanks, both of which were set up under seemingly identical conditions, produced an unsightly growth of algae, while the other one was almost free of algae. The question of light, both artificial and natural, entering the tanks, was investigated and was found to be identical in both tanks. Several other causes were dismissed and the problem remained.

A visiting horticultural expert was asked for his views on the problem and he immediately came up with the suggestion that the temperature in one tank was a few degrees higher than in the other. This was investigated and it was found that the tank which was kept a few degrees warmer than the other, was the one which produced the unsightly growth of algae.

As the difference in temperature was only a few degrees, the thermostat of the affected tank was adjusted so that the water in both tanks was at the same temperature. This happened a few weeks ago and now both tanks are looking identical in freedom from algae, except for the remains of the algae in what was formerly the warmer tank. The problem, which had remained for a long time, was solved in a few seconds with a screwdriver.

I have tried this solution with another tank and it has again solved the problem. Should any of your tanks have a problem of excess algae, check the temperature and see if it is much above 75°F. If so, it is well worth trying the temperature a few degrees lower for a period to see if it will solve the problem. It is such a simple solution considering the problems of adjusting light, water hardness, pH, and should be at least as safe as using chemical means.

Obviously the higher temperature favours the growth of some species of algae and the few degrees difference seem to be critical. I would be rather interested to hear if other aquarists with an algae problem find that this is the solution. If you have anything to report, please drop me a line c/o The Aquarist.
Mabuya multifasciata

Easy to feed and handle, these Skinks provide an attractive and fascinating addition to the vivarium.
ALTHOUGH less gaily coloured than many lizards, these skinks make attractive inhabitants of a vivarium. As in all skinks the legs appear weak in relation to the rather heavily built body but in this species the tail is longer and slenderer than in most of their near relatives, being as long or slightly longer than the body and tapering sharply from a thick base to a fine point. Their overall length is about nine to ten inches which together with their bulk makes them somewhat impressive in appearance. They are less active however than many smaller species and keep in good condition and seem to be perfectly content in comparatively limited quarters.

The dark grey of the upper surface merges into a lighter grey along the sides and contrasts pleasantly with the pale yellow of the throat and under parts. They are particularly handsome immediately after sloughing their skins, when the grey is over cast with dark, bright green which gleams like burnished metal in the sunlight.

I obtained my present pair of these skinks early in the year from a newly imported consignment. They are ovo-viviparous and I was told by the dealer who sold them to me that one of the females had produced five young ones shortly after it came into his possession. He showed me one of the babies which was dark, chocolate brown, almost black in colour and about two inches in length. He was feeding them on greenfly. This, apart from the trouble involved in collecting adequate supplies, seemed, judging from the condition of the one I saw, a satisfactory preliminary diet.

The adult skinks from the beginning were easy to feed. When I first brought them home they were even willing to eat blow-fly pupae. This was distinctly unusual as past experience had indicated that apart from fruit-eating lizards, these animals generally show little interest in food unless it manifests considerably more animation than that exhibited by a chrysalis. Possibly they had had little opportunity to feed whilst in transit and were sufficiently hungry to try anything their sensitive tongues suggested might be edible.

Since then they have been offered, and accepted, a variety of insects including locust hoppers, blow-flies, gentle mealworms and earwigs. They will also take woodlice. On the whole they show a preference for winged insects. Adult locusts are too large for them to cope with but they will each consume up to a dozen week-old hoppers at a “sitting.” The introduction of an unfamiliar insect (to them) appears to stimulate them into orgies of over-eating. Towards the end of the summer a plague of crane flies appeared in this area. Quantities could be collected in the space of a few minutes from the outside walls of wooden buildings. These were avidly consumed by the skinks which, between them, disposed of between sixty and seventy of the insects in twenty-four hours.

After such heavy gorging sessions neither skink showed much interest in food for several days but both put on weight and were in fine condition by the beginning of winter.

One imagines that this type of feeding approximates to that they would experience in the wild state, where the advent of sudden swarms of insects would enable the lizards to build up sufficient stores of food in their bodies to enable them to survive periods of scarcity.

Apart from drinking, which they do by lapping up water with their long tongues, the skinks show little interest in water. Mine are kept in a very dry vivarium, eighteen inches by fourteen inches by fourteen inches, covered with a lid, in which holes covered with perforated zinc afford ventilation, and furnished with a bark covered log. Aquarium gravel to a depth of two inches is spread over the floor and at times, although they are usually to be found in the open part of the vivarium, they bury themselves in this medium or hide behind the log.

One of them once disappeared for several days in this way and when resurrected showed no inclination to eat. The animal deteriorated so rapidly that it became necessary to forcibly feed it with mealworms. Once having swallowed the larvae its appetite returned. The introduction of a dozen or so spiders completed the “cure” and within days it was eating its normal quota of food. It was some weeks however before it replaced its lost weight. Since this incident, if either skink has remained hidden for more than a few hours, I have uncovered it and there has been no repetition of the trouble.

These skinks are particularly satisfactory animals to keep as they rapidly become very tame. A week or so after they came into my possession both would take mealworms from the fingers. Individuals do vary to some extent. One of this pair, the female, gives the impression of enjoying being stroked, especially when it is in the process of sloughing its skin, whilst the other, although perfectly steady even when a hand is introduced into its quarters, dislikes being touched and slides out of range at the too close approach of a finger. The female shows no resentment and does not attempt to escape when picked up. I am told that these skinks will sometimes bite but none of the species has ever done so in my experience. This again may well be an individual idiosyncrasy.

They do dislike sudden movements and when the lid of the vivarium is raised, care should be taken to do so gently and unhurriedly as, though normally rather slow-moving creatures, when startled they can keep up a considerable distance and move with surprising celerity.

Whilst these skinks live together with other members of their own species of approximately the same size, it is undesirable to mix them with different kinds of lizards, particularly if the latter are smaller than themselves. On the one occasion I did so, their projected companion being a good sized Wall Lizard, the skinks left no doubt as to their intentions, which were far from honourable, and it became necessary to remove the Wall Lizard with the utmost dispatch.

Coming as it does from a far warmer climate than ours, *M. multifasciata* requires a heated vivarium. I have obtained entirely satisfactory results by fitting a 25 watt, pearl electric light bulb into a socket screwed to the underside of the lid. The bulb is connected to a thermostat and maintains a constant temperature of 80°F.

The genus *Mabuya* is widely distributed throughout Africa, particularly in the South and West, where they are mainly found on exposed steppe land and savannah. They also occur in mountainous regions to a height of 5000 feet.
Cross-breeding the Barbs

by Ray Leggett

BEING an enthusiastic breeder, I was agreeably surprised when I noticed one of my male Black Ruby Barbs spawning with a female Rosy Barb. As they were in a community tank other fish were feasting on the eggs as fast as they were expelled.

I netted out the Rosy Barb and removed her to a tank of Rasboras and commenced feeding a diet of mosquito larvae, ox-heart and earth worms which I had found very good for conditioning females previous to spawning. Approximately 14 days later the Rosy Barb was again quite full so I set about preparing a breeding tank. From previous experience I found the best set-up for medium-sized Barbs was a 10 gallon 24 in. by 12 in. by 12 in. tank with the base, one end and the back painted dark green. As a spawning medium I used boiled coconut fibre which I arranged loosely along the back half of the tank and held down with several strips of lead sheeting.

I positioned the tank in a quiet corner of the fish room where the early morning sun would enter the front glass. The water was aged tap-water with a pH of 6.8 and hardness of 70 p.p.m. A heater and thermostat together with mild aeration kept the temperature at a steady 75°F at this stage the water level was 6 in.

Both fish were introduced an hour before sunset and I then left them alone and waited for results. I had hoped to see them spawning the following morning; however, they appeared to be completely disinterested in one another at this stage. That evening I added 1 in. of cool rain water as a stimulant and sure enough next morning I was rewarded with a good batch of eggs.

I was able to observe the pair spawning, the Ruby driving the Rosy into the fibre where several eggs were laid and fertilised.

Spawning completed I removed the parents and added methylene blue to guard against fungus. By evening I noticed a considerable number had turned white and concluded these were unfertilised. I estimated that 150 eggs were laid and of these only 25 hatched. However, I was more than pleased and commenced the usual fry feeding.

At four weeks they were ½ in. long and had a similar colour and body shape to young Rosy Barbs, they then began to develop a shoulder stripe and black markings in their dorsal fin. At 12 weeks they were 1½ in. long and showing the shape and colour they maintained into their adulthood. Body shape was very similar to Barbus ticta. They had a black, gold ocelated spot on the caudal peduncle, one black bar running from the front of the dorsal down to the ventral fin. The leading edge of the dorsal was black with the remaining portion clear as were the rest of the fins. The overall body colour was a dull silver.

I spawned the parents again and this time received a greater number of fry but many were slow at developing and died off over the first six weeks.

In all I reared eight from the first spawning and 12 from the second. Although I tried on several occasions, I could not induce these fish to spawn and as they all showed the same colour and finnage I did not succeed in sexing them.

During this time I decided to try several other matings and set up the same male Ruby with a Tiger Barb. On the fourth day these spawned, however the eggs failed to develop. I then tried a male Tiger Barb with the original female Rosy. Unfortunately, no eggs resulted; in fact, although the Tiger had been in brilliant colour previous to placing him in the spawning tank he lost all colour and simply hid in a corner in typical Barb fashion.

Next I paired the Ruby with a female Golden Barb (Barbus semicinctus), eggs were received and fry hatched but all died within a few days.

I would like to have been able to further my experiments but as I was due to commence an overseas trip I had to sell my tanks, equipment, etc., and therefore gave the hybrid barbs to a fellow aquarist to continue attempts at breeding.

At the time of writing he has had no success and I can only conclude that they are males.

"I sometimes wonder if we move in the right circles"
The growth-habit of *Vallisneria*

by B. Fry

The species name of *Vallisneria spiralis* has nothing to do with the narrow ribbon-like leaves: it refers only to the coiled flower stem produced by the female plant. The male plant is not common. And the flowers it produces start life in a sort of translucent green mini-bag held close to the crown. In due course this green bag splits and releases lots of three- or four-petalled flowers. These rise to the surface where they open wide and display tiny yellow pollen heads. When a male flower meets a female flower fertilization takes place, whereupon the female flower stem contracts its coils and the seeds ripen near the bottom.

The names of “torta”, or “tortifolia”, applied to those vallisnerias with corkscrew leaves, derive from the Latin *tortus*, meaning “crooked” or “twisted”, but are not valid in botanical circles except, perhaps, as a varietal or third name, because vallisnerias with corkscrew leaves are merely natural sports, or forms developed from natural sports, of straight-leaved plants most of which seem to occur in the wild state in America or Asia.

*V. spiralis* itself is native to the southern half of the U.S.A. and southern Europe. The generic name of *Vallisneria* is after A. Vallesneri, an old-time Italian botanist. Between the two World Wars vast numbers of *vallisneria* plants used to be exported from Italy to meet the requirements of the aquarium trade. Much earlier it was used by doctors for the very practical purpose of keeping the water in the jars containing live leeches in a well-oxygenated condition.
Building and fitting out a fish-house

by A. Boarder

There are several types of fish-house and the choice must be one for the individual. No doubt most of them will be intended to house tropical fishes but any fancy goldfish enthusiast will find that a fish-house is of great benefit to him. The average pondkeeper will not require a fish-house but if a coldwater aquarist with a pond has some very good specimens of fancy varieties, it would be a good idea to breed in a fish-house where temperatures may be controlled. Some handymen will prefer to build the fish-house and so not only save expense but plan the building so that any special feature may be incorporated.

It is not always easy to adapt a house of a certain type to fit in with any special arrangement needed.

Whether the fish-house is to be for tropica or coldwater fishes there are two main types of construction. These are the span roof and the lean-to shapes. The lean-to is a very good one if it is to be built against a wall of the dwelling. This means that one wall is saved and not only that but it is almost certain that it will be easier to heat such a house as it will have a good solid wall to keep out the cold and give protection from winds. It may also be far easier to connect up any electric cables that may be required for heating the house.

Before erecting any permanent or semi-permanent structure it will be wise to contact your local authority to see if it is necessary to submit plans before building takes place. Usually no objection is made to portable sheds. If the necessary permission is not obtained beforehand it may mean that you will have to pull down the structure. Before making up one’s mind as to the type required it will be a good idea to look through one of the gardening publications. These usually carry several advertisements for not only many types of garden shed but also garages. It may not seem a good idea to use a garage but some of these would make excellent fish-houses with a little adaptation. The main changes would have to be the alteration of the large door and the provision of more windows, especially in the roof.

Garages can be obtained in timber, in asbestos sheeting or concrete. Their prices range from £40 to £80. Timber garages can be cheaper depending on their construction. Some are made with weather-boarding whilst others are made with tongued and grooved timber. The latter would be dearer, and prices can vary as to the kind of timber used. The red wood types such as cedar and other non-rotting types are more expensive but could be a better buy as they would last longer.

If a cheap timber-constructed one was bought it could be well painted with Cuprinol to preserve the wood and a lining could be made with some kind of insulating material between this and the outside. This insulation is very important as such a condition could save expense when the question of heating comes to be considered. The internal lining can be of hardboard or some other form of sheeting. For a cheap lining it is possible to do the task for next to nothing apart from the cost of the filling. It is always possible to obtain large cartons from various shops and these can be carefully opened out by removing the clips. Most of these cartons are constructed with a form of cardboard which has a corrugated lining. Such material is quite good as a liner for a fish-house. Once the lining is tacked into position the space between can be filled with any material to make a good insulation. Special mica (treated matter) is available and forms of Polystyrene fillings can be bought of the type used for insulating water pipes and tanks.

Once the cardboard is in position it can be covered with a cheap wallpaper or just have the joints sealed with strip tape and covered with an emulsion paint. If the fish-house is not insulated in some manner it will not be likely to function very well and is certain to be expensive to keep warm.

The size of the fish-house will depend on the space available and the amount which it is intended to spend. I do not think that a house would be of very much use if it was under 10 ft. by 6 ft., with about 6 ft. to the eaves and 7 ft. 6 in. to the top ridge. Such a construction would allow tanks to be arranged on each side, leaving the end opposite the door for the erection of a folding table on which one could work.

If the house is 6 ft. wide it would allow a good path up the centre with space each side for tanks up to 15 in. wide. A firm angle-iron staging is essential and this could be so constructed that one side could hold four rows of tanks one above the other, with four 24 in. tanks in each row. The other side of the house could hold rows of 36 in. by 15 in. by 15 in. tanks. If the door was made to open outwards this would give a little more space inside when one is entering or leaving.

With the two tiers of tanks at the sides it is possible to have shelves along part of the upper centre of house so that pumps and any other necessary equipment could be housed out of the way. Before the size of the proposed house is decided upon, it will be well to make a plan of how the inside will be fitted so that space is not wasted.

Having made up one’s mind as to the type to erect, it will be necessary to prepare the site carefully. It will be found that it is a very good idea to construct some small pools at floor level on each side. These can either be constructed of concrete or tanks can be inserted in the ground. Once the site is marked out it will be necessary to provide a good foundation. A 9 in. wide footing of concrete will be good providing it is about 9 in. deep on a firm base. Once this footing is made the pools can be constructed. These will be very useful for the coldwater specialist in which to rear youngsters but it will also enable the tropical breeder to use them for spare plants or for breeding live foods. Instead of making the footings of concrete some concrete slabs could be used but if they

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must be firmly set in concrete to prevent any movement. It is also important to ensure that the footings are quite level at the top. Some special water-proofing can be laid on top before the shed is erected. Rolls of this material can be obtained from builders’ merchants. Without this protection the damp could creep up and cause the timber to rot if this material is used.

When the footings are completed, the pools can be made. They can be 15 in. wide and run the length of the fish-house. Whilst the concrete is still soft, one or two divisions could be inserted. These can be pieces of glass or thin timber which is wrapped in newspaper. When the concrete is set the divisions can be drawn out easily and proper slides made to fit. The depth of the pools need not exceed nine inches.

The provision of windows for light will have to be considered. Some garden sheds, quite suitable as a fish-house, are sold with windows all along one side, but if sufficient windows are not included they can always be added. There will be no lights in the roof and so something will have to be done about this. Some types of corrugated plastic sheets are now available and one or two of these could be fitted into the roof to give all the necessary light. Too much light should not be provided as in the summer months the house could get too hot, although it is possible to fit blinds which could be used if the fishkeeper was likely to be at home during the day time.

It is possible to fit stout plastic sheeting inside the roof to ensure that too much heat is not lost during the winter. Just a gap between will help to keep the inside of the house an even temperature. Whilst constructing the base foundation it may be possible to insert a water pipe so that it could be connected up to the house supply as an adequate supply of water is always an advantage. Before the inside lining is fitted it will be a good idea to run any electric cables which will be needed and these can run to a switch board at the end opposite the door. A double-poled switch and fuse box should be included and if you are not knowledgeable in electricity get someone who is to do the installation.

If a concrete garage is being used it may be possible to remove one of the roof sheets and replace it with a transparent plastic one. Many of these garages are roofed with corrugated asbestos sheeting and one can obtain plastic sheets with the same flange for easy fitting. If the fish-house is of a fair size it will be a good investment to fit plastic guttering round it so that rain water may be directed into a butt for use if required.

The floor of the house can be concrete between the pools and a false flooring of timber which can be removed if necessary will be an advantage.

The heating of the house will be the next consideration. The main question for the tropical fishkeeper will be whether to space heat or heat each tank individually. To heat tanks to about 75°F, for most of the time will require a very warm atmosphere all the time and this cannot be provided very cheaply. An oil central heating system would be all right but would be costly. Also electric heating for the whole house would be expensive. Heating by an oil lamp could be satisfactory but a fairly powerful one would be required for the medium sized house. A good type of greenhouse heater which burns with a blue flame would be very good and as long as good quality paraffin was used and the lamp kept clean all should be well. To be certain that tanks are kept at the required temperature I consider that they should be heated individually. In this case if a tank was not in use the heater could be switched off. Where several tanks are of the same size it is often possible to run four or more from one thermostat.

Some aquarists have constructed a system of water changing where filtered water is run into tanks at the top of the range and flowing over into the next tank. I do not like this system as not only can the flow pipe get choked and so cause a severe flooding but if there is any disease or pests in one tank the trouble could be spread through all the tanks.

It may be possible to fit a sink into the end of the house and a runway into a sump or drain. This will prove very useful for getting rid of unwanted water when servicing any tanks. The lighting need only be necessary for the tanks and these should all be fitted with hoods and lights. The space between the top of a tank and the one above it should never be less than six inches. Otherwise it will not be easy to use a net if required. This does not mean the distance from the top of the hood as this can always be removed when needed.

If one is handy with tools and cares to make the fish-house himself it is probable that a good strong job can be made but it is rather doubtful if one can be made much cheaper than a bought one as timber is so very dear these days.

Apart from using timber there are other materials which could be used. If a stout frame-work was made it would be possible to cover it with asbestos sheeting. The corrugated type is the stronger but the plain is quite strong and will last for years and is only likely to break if given a sharp blow. Breeze blocks could be used for the outer structure and these could be floated over with a cement mix to make a good looking job. The latter type would have to be a fixture but the former could be so made that it would be portable, the sides and ends being bolted together.

Where the fish-house is some distance from the living quarters it may be possible to lay a length of the new type plastic hose so that it could be connected up to a tap in the house and to a pipe in the fish-house. This will obviate carrying water about and as this type of hose is practically everlasting there will be no need to roll it up after each time of using. Anyone who has had to deal with a goody length of this hosepipe will know how it can act in the strangest manner, as it can grab hold of the slightest projection and become tangled up.

Once the house is completed the setting up of the tanks will be the next task. If the tanks are made to a similar pattern and size it will be possible for them to be interchangeable and so save wasting space. For the supply of electricity for heating and aerating it will be a good plan to have a proper switch board so that plugs can be inserted easily without having many unnecessary distributors about.

Most of the feeding wires can run near the back of the tanks so that it is mostly out of sight.

In conclusion I must point out that what I have written is intended only to be a guide, as each fishkeeper will no doubt have special wants in mind but he will be able to decide on these by comparing with the ideas given.
The housing obsession of the Hermit Crab

by R. T. F. Gantès

During your stroll along the sea-shore, you must certainly have noticed, time and again, a number of shells that go scurrying across the rocks and sand in a manner very different to the slow regular reptation of a winkle or other gastropod. If you pick one up to try and find out what sort of animal is in it, all you will see of it at first is a pincer closing the opening. In a little while, however, a small spider-like creature will pop its head and "paws" out and start scratching the tips of your fingers indignantly; it is a hermit-crab.

There are various species of this crab thriving under various latitudes; some are exclusively marine, some live on land and some share their existence between the two elements. But in any case they all have the same problem: a long, tender, unprotected abdomen that makes many jaws and bills water. To place this delicacy out of reach of the gastronomical ambitions of their surrounding enemies is vital for the hermit-crabs. And all of them, wherever they live and to whichever species they belong, use, approximately, the same method of defense which consists in crawling backwards into the empty shell of a deceased gastropod. The tender parts of the hermit-crab are thus protected by the shell and even if the shell is cumbersome, it is far better than walking about naked.

You might think it must be terribly painful to twist your body into a spiral so as to be able to thrust it into a snail-shell, but this is not always true. The hermit-crab's body is supple and flexible and we can even say that it has a natural curl. Furthermore, its rear part has a little hook-like organ with which it anchors itself to the interior of the shell. If Mother Nature began by playing a nasty joke on the hermit-crab, it seems she has since done her best to make up for it.

Alas! if the hermit-crab is still a thing of this world thanks to artificial proceedings, it remains, nonetheless,
an unhappy being, mentally unbalanced; a psychopath as one might say speaking of mankind. And of this we feel sure after a certain number of experiments performed in Kenya when we wanted to photograph a hermit-crab changing shells.

Let us here make a pause to explain what we mean. The hermit-crab, as we said, lives in a shell. So do snails, oysters, cockles, mussels... But in the latter cases the shells are something like an external skeleton that the wearers produce themselves and that grows with them. Things are different with the hermit-crab which is incapable of building a shell and dwells in a borrowed one. When it begins to outgrow this shell, all it can do is to start looking for a larger one.

One morning when the tide was low on the fairy beach of Turtle Bay, Kenya, we suddenly noticed something we had not noticed before because our attention had been attracted by so many other things: two tiny hermit-crabs bustling around an empty shell. Almost immediately, a third one sprang out from nowhere to join them.

"Ha! Ha!" we thought, "somebody's going to swap shells!"

And we prepared our cameras to immortalize the event. A fourth, a fifth hermit-crab turned up, but nothing ever happened until the tide came up again and washed the whole ballet away! It seemed to us as if each hermit-crab had said to itself:

"I will have to change my shell one day. I would willingly try this one which might be better than mine. But in the meantime someone might steal mine. And if this other shell is less comfortable than the one I am wearing..."

And this is how hundreds, thousands, millions of hermit-crabs waste their time on the coast of Kenya and probably everywhere else!

"Well," we thought, "man must help nature." And we thought, in a manly manner, that if we took one hermit-crab, one empty shell, put them side by side and shoed away all the other competitors, our little fellow would be pleased to show us what it could do. The little fellow, however, did not seem pleased at all. Every single hermit-crab we placed in front of an enticing empty shell, after a short moment of breathless immobility, suddenly took to its heels and ran away.

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The Hermit Crab

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Aggravated by this uncooperative attitude, we tried the strong way...with tweezers.

After having buried the two separate parts of the heroic animal that had let itself be torn apart rather than give way, we decided it was not the right way. "Why don't you try heating the shell on a candle," suggested a friend, "with a blob of butter, a little garlic, a drop of white wine..."

We suspected our friend of being under the influence of an expensive French cookery book. However, since you should never neglect an inoffensive suggestion, we tested the idea of heating the shell...but soon put a stop to it when we saw the amount of useless suffering we were inflicting: we are convinced the poor little beast would have let itself be cooked rather than leave its burning shell.

On second thoughts, we figured, maybe these systems were too brutal; under the effect of sudden fear or pain, the animal would only react to blind instinctive impulses. But if we managed to bear upon it a slow progressive constraint that would give it time to use its brain, it might eventually come to the reasonable solution we desired: that is to say, to take the risk of leaving its shell when remaining in it becomes unbearable.

This is how we came to the idea of the basin. In theory it was a good idea and quite simple. Here is the recipe: fill a basin with sea-water and drop a few hermit-crabs inside; after some time, the hermit crabs will begin to feel ill at ease due to the progressive corruption of the water; place a few flat stones along the inner sides of the basin forming steps up which the crabs may climb to freedom if they rid themselves of the weight of their shells...and wait... We waited, and after a few hours in the tropical sunshine the crabs were still in their shells at the bottom of the basin, and so groggy that all we could do was to let them go before they died.

At this point we were far more interested by the insane obstinacy of these little creatures than by our photographic sequence. They reminded us of certain human attitudes, both stupid and heroic, that constitute some of the most moving pages of our history books.

The last experiment we invented was so astute that we are still today, mildly surprised by our cleverness.

We put a land-living hermit-crab in an old canary cage and left it on the beach. The spaces between the bars of the cage were wide enough to let the crab out, but not its shell. Beside the cage we placed an empty shell, similar to the one it was occupying. And we waited. We waited two days in vain. Though freedom and safety represented by the second shell were but a few inches away, the crab remained in the cage, turning round and round, with no food, a prisoner not of the bars but of its shell!

Let us recapitulate the situation: here is a particularly vulnerable animal that would have long been extinct had it not found a means of protecting its fragile parts by introducing them into an empty shell. The hermit-

Continued on next page
Find the fish
by D. Theil

The first is in BUS but not in TRAIN,
The second is in HALTER but not in REIN,
The third is in SHRUB and also in TREE,
The fourth is in OBSERVE but not in SEE,
The fifth is in CUBE and also in SQUARE,
The sixth is in SURPLUS and also in SPARE,
The seventh is in TRIKE and also in SCOOTER,
The eighth is in WHISTLE but not in HOOTER,
The ninth is in COTTAGE and also in CROFT,
The tenth is in ATTIC and also in LOFT,
The last is found in HOUSE and in HOME.

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The Hermit Crab
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...crab did not build this shell. It is incapable of enlarging it. The shell is not part of its body as the snail-shell is part of the snail. It is merely a provisional shelter that the crab found, occupied, can leave when it wishes and will be obliged to leave one day, in any case, when it outgrows it: in other words a useful object as are, for us fragile humans, a pair of shoes or an overcoat. That the hermit-crab should stick to its shell as long as this shell offers it an adequate protection is an absolutely reasonable attitude to which no sane person can object. But when we see the shell take on an exaggerated importance, ask for more than it can give, become a tyrannical obsession in the life of its wearer, we feel that something must have gone wrong somewhere.

We have seen that what should have been a reassuring shelter, far from appeasing the hermit-crab, becomes a subject of constant worry. We have seen the poor little beach-trotter, ever unsatisfied, crawl for hours round an empty shell that the tide will finally wash away before it could make up its mind whether it wanted it or not. And when we consider that it prefers to be cooked or pulled to pieces, die of starvation or asphyxiated rather than leave its shell, we are obliged to believe that this is not a rational behaviour and that we are dealing with a minute lunatic.

But when we think of the number of captains who have wilfully gone down with their ships, of the number of soldiers who have fought hopeless, useless battles and not surrendered, of the number of people who have had to be forced out of their homes during floods and fires, when we think of the hundreds of men, women and children who are killed every day in the name of ideas and ideals that were supposed to ensure them a happier living, we can but wonder if mankind is not quite as insane.

April, 1968
Remedy Review

"Snail Rid", for killing aquarium snails, price 8s. 6d. post paid.

This product which has been advertised in the American press for some time, is now available in Britain. It is supplied as a green liquid in a clear plastic dropper-bottle and is a solution of a copper salt. It is applied at the rate of 1 drop of solution per gallon of water and is colourless and odourless in use, becoming inactive in two to three weeks. "Snail-Rid" is claimed to be harmless to healthy fish and most plants but under certain water conditions it is better to siphon out several gallons of aquarium water whilst removing the dead snails. This is no problem as the snails have to be removed anyway. Dead snails should be siphoned out 8-24 hours after treatment.

This remedy may affect some plants and I found that Ceratophyllum (Hornwort) showed some signs of disintegrating, but when some of the tank water was changed the plants recovered. This is pointed out in the leaflet with the remedy. If there are a lot of snails in a tank the treatment may have to be repeated a few days after the first dose. The treatment also claims to kill most snail eggs but those which escape can be killed after hatching.

If snails are one of your problems, "Snail-Rid", carefully used, can be the answer.

Equipment Review

Hydro Brine Shrimp Hatcher, price 9s. 6d.

Few aquarists would disagree that brine shrimp is the best food for most baby fish but the problem of hatching the shrimp and then separating them from the empty or unhatched egg-shells produces a time-consuming and patience-trying occupation. Having tried the Hydro Brine Shrimp Hatcher I must admit that most, if not all, of the problems seem to have been solved.

The unit consists of a flat plastic dish which has several compartments which are open at the top. On these sit a series of plastic rings which are joined together. The salt mixture supplied is dissolved in the appropriate amount of water and poured into the unit. The packet of shrimp eggs, which contains about 500,000, is scattered on the brine solution in the outside ring, and a little plastic cup, complete with handle and strainer is fitted into the middle of the unit. The lid is placed on the unit which is placed in a warm, light position. As the eggs hatch, the shrimp are attracted to the strainer area, which alone is in light, and the shrimp can be removed in the strainer, washed quickly under the tap, and rinsed into the tank of baby fish.

The hatcher can be floated in an aquarium but I have had as much success with it sitting on the cover glass of an aquarium, the light attracting the shrimp. The hatcher only takes a couple of minutes to set up and the shrimp can be removed, freed from egg shells, washed under the tap, and used, in a matter of seconds. Shrimps are available in about two days after setting up the hatcher and suppliers are available for four or five days. Two or more hatchers can be used when large supplies of shrimp are needed and hatchers are designed so that they can be stacked on top of each other. The unit is supplied with a special plastic spoon which is used to measure the quantity of salt and of shrimp eggs needed for each hatching.

To me, this is the easiest and most efficient method of hatching brine shrimp for the aquarist with a couple of tanks.

‘African Aquarist’

African Aquarist is a bilingual monthly (English and Afrikaans) which will be especially welcomed by the growing band of aquarium keepers in Southern Africa. The first two issues (November and December) include articles on the importance of vitamins in the diet of aquarium fish, tilapias as destroyers of mosquitoes and as an easily raised food for the peoples of Natal, breeding the red-tailed black shark, the history and care of the goldfish, and building and stocking a marine aquarium.

The editor, Mr. D. Pistor, a professional journalist with considerable experience in fishkeeping behind him, is hoping to feature articles on some of the new (to aquarists) cichlids from Lake Nyassa and threeshores, and other African fishes, in the near future. Although African Aquarist is primarily for fishkeepers, we hope that Mr. Pistor will not close his door to articles on the reptiles and amphibians of the Dark Continent. For as well as on-the-spot observations on African fishes, those of us— and we, too, are a growing band—who combine vivarium keeping with aquarium keeping would benefit from some articles on the natural environment (terrain, temperature tolerance, and the like) and care in captivity of the various creatures that, millions of years ago, forsook the dwindling waters for the land. African Aquarist is published by Torps Publishing Co., P.O. Box 1275, Bloemfontein, S.A. It sells at 3s. 6d. a copy or £2 for 12 issues, post paid.

J.H.
Etropiella debauwi

Etropiella debauwi, commonly called the three-striped glass catfish, is a member of the family Schilbeidae. Members of this family, that range in length from a few inches to a foot or more, are widespread over tropical Africa, and parts of Africa beyond the tropica, and southeast Asia. They are characterised by an elongated body flattened on the sides, spiny (anteriorly) dorsal and pectoral fins, a long-based anal fin, and teeth in the jaws and palatine bones. In most species of the numerous genera an adipose fin, of sorts, is present, and, with a few exceptions, the caudal fin is forked to a greater or lesser degree. The barbels, four to eight in number, may be either short or long.

E. debauwi is native to the Stanley Pool region of the Congo. It was first described for science by G. A. Boulenger, the zoologist and authority on African fishes, in 1901. But it was not until some fifty-three years later that the species began to turn up in the tanks of dealers in Europe and America. Like so many interesting and choice fishes from the troubled Congo, E. debauwi does not come onto the market as often as one would wish. Also, there appears to be no record of its having bred in captivity.

The body is silvery, almost glass-clear in parts, shading to pearly white on the throat and belly. There are three dark grey to blackish stripes on the sides, the middle one extending onto the fork of the caudal fin. The dorsal fin is short and is situated close to the head. Three pairs of barbels, silver like the body, and so fine as almost to escape notice, are carried in a forward position. The sexes are not easily told apart, but in well-grown specimens the male (according to authoritative writers) is slimmer and darker striped than the female. A length of 3 in. may be attained.

Unlike most catfishes known to the tropical aquarist, the three-striped glass catfish finds its pleasure and its food in the middle and upper levels of the water. In short, it is neither a floor-shuddler nor a seeker-out of other fishes’ left-overs. It swims in short, sudden darts or rapid dashes (when frightened) from one end of the aquarium to the other. It takes its rest in a slightly head-upwards position, its tail shaking perpetually.

With regard to food, E. debauwi is essentially carnivorous, and it is reasonable to assume that insects, aquatic and otherwise, make up the bulk of its diet in the wild. But be this as it may, in captivity it can be fed on a wide variety of food, dried food included.

At this point, however, it is necessary to mention that not all specimens will accept everything, and some newly-purchased specimens may refuse to take any food at all. But unless there is something very exceptional about the fish or the aquarium into which they have been introduced, interest in food will be resumed within the space of a few days, provided the fish are left in peace and quiet to get over the abrupt change of environment.

In the matter of environment, E. debauwi settles down fastest in a long aquarium (24 in. at least) filled with clear, well-aerated, soft, neutral to slightly acid water maintained at a temperature of from 75°F. (24°C) to 78°F. (26°C). It should be furnished from the middle back with dense thickets of tall-growing vegetation.

Last but not least, E. debauwi is a shoaling fish and usually becomes increasingly inactive and mopy if it is separated from the company of its own kind. Obviously, then, if the fish is to flourish, it should be kept in a group of three or more. Equally important is the fact that it should never be placed with any fishes (it will not harm other fishes) that will become so interested in its fascinating quiverings that they will take bites at it or worry it to an early death by too much jostling or boisterous activity.

FIND THE FISH—(see page 367)
Answer BARBUS TICTO
Our experts' answers to your queries

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of the fancy being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent so that a direct reply can be given.

COLDWATER queries
answered by A. Boarder

A heron is taking goldfish from my pond. Is there anything I can do to keep it away?

Once a heron finds fish in a garden pond it may return until all the fish have been eaten. Herons do not usually alight in the water but do so near it and then walk in. This gives you an opportunity to run some fine black wire around the pond at about a foot high. This can be so arranged that it is hardly visible and when the bird touches it it will be scared away. It is also a good plan to place one or two pieces of mirror glass hanging from sticks near the pond. The reflection will often frighten a bird away. If there are plenty of water lily leaves covering part of the pond the fishes would be able to get out of sight.

I have four goldfish in a tank 16 x 10 x 10 in. They do not seem to keep healthy. What is wrong? I feed on ants' eggs.

You do not say how large the goldfish are. The tank should not have more than about six and a half inches of fish. If more than you will always have trouble. Get a tank not less than 24 x 12 x 12 in., and you should have no trouble keeping the fish healthy. Ants' eggs are not eggs at all but the dried pupae. Change to one of the modern foods as advertised by dealers in The Aquarist.

I have a pond in my garden and during the summer a quantity of scum used to appear on the surface of the water. After rain it disappeared but came up again after some time. What is it and what can I do about it?

The scum is caused by something, either decaying vegetation or uneaten food, which decomposes and has a lot of gas form around it. When the water warms up this scum rises to the surface. The only way to have cleared this away would have been to empty the pond and give it a thorough clean out. Next season do not over-feed with dried foods.

I have to move house shortly and wonder if I could make a pond at this time of the year? Also can I keep my coldwater fishes indoors for a time?

You could make a temporary pond at this time of the year. An easy way would be to get a sheet of heavy-gauge polythene and make a hole in the ground for it. This should last until you could make a more permanent one. To keep coldwater fishes indoors you will have to see that they have plenty of swimming space. You need not feed them as long as you keep them in a cold position. The colder you can keep them the better will it be for them. The water will hold more oxygen than when it was warmer and the fishes will not move about much and so need very little oxygen.

I have bred a large number of goldfish fry this last season but have lost almost all of them in about a month. I fed on a liquid fry food but they kept dying at about ten a day until I had lost them all. What went wrong?

It is difficult to make a guess as to why the fry died. There are several reasons why this should have happened. Most liquid fry foods are only intended for the first few days when larger foods must be given. Perhaps you kept them on the fry food too long. They may have been over-crowded in the tank with insufficient oxygen. They may have been attacked by gill flukes and this would soon clear them off. Sometimes if the water is impure the fry will develop a kind of fungus on their gills and soon die after this. This state can often be rectified by adding some salt to the water. Do not give much, about a teaspoonful to each gallon of water should be enough. Before adding any salt make sure the water is in good condition, and if not change it at once.

I have a fantail goldfish which has its fins all closed and it lies on the bottom of the tank. What is the matter with it and the cure?

The fact that all the fins are closed signifies that the fish is in a bad way. Its condition may have brought on an attack of swim bladder trouble. With this latter trouble, the fins do not often fold and the fish appears to be quite well in itself except that it cannot keep its balance. Your fish may be suffering from bad conditions in the tank. This would soon upset it and it would become ill. It can also affect to diseases. Go over your whole procedure and examine all details of the tank, water, plants, etc., to see if you can pin down any factor. Goldfish do not just fall ill for no reason and a properly run tank should never start any trouble with its inhabitants. See that you have no more than an inch of fish to each 24 square inches of surface area. See that there are no harmful metals in contact with the water; copper is particularly dangerous. Make sure that there is no heavy tobacco smoking in the room.

Will you please advise me as to the best floating plants for a coldwater aquarium?

It is not usually necessary to have floating plants in a coldwater tank. If you have over-head lighting you will only cut out much of the light. However if you would like to have some I know of nothing better than duck weed, Lemna. This will gradually spread but can be kept under control easily. It is also a good food for goldfish and so will serve two purposes.

I have a large indoor tank with goldfish and they keep pulling up or shredding the water plants. They are two kinds of elodes. What can I do?

I never have this trouble and had my tanks set up continuously for the past 17 years. I have never had a plant pulled up. You might like to try some Sagittaria natans. This is fairly strong and should prevent much for your fishes. Give them plenty of duck weed to eat.

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when you can get it, and some Beccas may give them the vegetable matter they need. See that all fresh water plants are well rooted in small plastic pots before putting them into the tank. The fishes might not be able to move them as easily then.

I have a six-weeks-old brood of Carassius. I have been feeding them almost entirely on green water plants. Now the fry swim up and down with a movement like fish. Some show an air bubble in their stomachs.

It may be that the fry have had too much salt through the constant feeding with the brine shrimp. It is not fatal to supply a little salt to fry but the quantity in your water is unknown. The condition resembles that of emulsion, and this gives air bubbles inside a fish. It can be caused by over-feeding, and I have known fishes suffer from it after having been placed into a tank which has been recently filled with fresh tap water drawn in with great force. Try a change of food, such as mashed earth or white worm and then see if conditions of the fry improve.

What is the difference between Veiltail and Fantail goldfish when young?

The difference appears as the fry develop. When very tiny they look alike but as they take on a more adult form, between a month and six weeks, according to their rate of growth, the caudal fin begins to change in shape. The Veiltails will show an enlarged tail with more rounded ends and a lack of forking. This forking means that the ends of the caudal fin are straight or nearly so and do not have a deep fork as is found in the Fantails. By three months of age the Veils should show a deeper body than that of the Fantails, but in some strains the body of a good Fantail can be as deep as a poor Veiltail. The dorsal fin of the Veiltail should be much larger and more rounded than that of the Fantail.

I reared one young goldfish from a pond spawning and it has been kept indoors in a living room all the winter. I would like to put it in the garden pond and would be glad to know when to do this.

The fish can be put in the pond when the temperature of the pond water has risen to somewhere near that of the container in which the fish has been kept. The morning may be the best time to do this as the temperature of the water in the container may have cooled down. When you do move the fish let the container float in the pond for some time to give the temperature a chance to even out somewhat. Most fishes are able to move from one range of warmth in a pond to another with no ill effects. What can harm a fish is if it is dropped from a warm carrying can into a very cold pond. This sudden shock can disturb the swim bladder and the fish can lose its balance.

I have to move house about 150 miles and have a number of pond fish which I would like to take. How can I move fairly large goldfish and orfe?

The modern method for transporting fish is in large plastic bags which are kept firm in a strong cardboard container. The bags are not filled with water and some oxygen is pumped in before the bags are sealed. Fishes will travel quite safely for long distances in such containers. You might get a dealer to advise you and lend you the containers. The orfe must not be crowded as these are the first to suffer from any lack of oxygen. The colder the weather for your move the better will the fishes travel.

The water in my pond has a murky appearance. What is the cause?

In the early part of the year the under-water oxygenating plants have not yet had a chance to grow and so assist in purifying the water. It is probably that as they grow the water condition will improve. You may have been over-feeding with dried food and the uneaten food will soon pollute the water. You also state that the pond is 3½ feet deep. I find that any pond over 2½ feet deep, unless it is also very large is more trouble to keep pure than a more shallow one. I think 2-3½ feet is ample for the average garden pond. If you change most of the water once the plants are making active growth it may remain in better condition.

Can you let me know how to breed white worms?

Get a box, a plastic one will do. Put in some damp peat to about an inch from the top. Then put a piece of damp white or brown bread on top with a few worms beneath. Now place a sheet of glass on top so that it lies directly on the peat. Cover the whole to exclude the light. Keep in a cool place and never allow the peat to dry out. The occasional replenishing the damp bread will be all that is necessary. After about a week or so the worms will have multiplied enough for you to take some out for feeding to the fishes. Once you have a good supply you can start other boxes. If the boxes used are all of the same size they can stand one on the other and take up little space. If a small knob of cheese is pushed into the surface of the peat, many worms will congregate round it and can be picked out with tweezers by the thousand.

How can I breed Japanese Koi carp?

The method of spawning is just as for the goldfish. They are a type of carp and so breed in a similar manner. Condition with plenty of chopped garden worms and then carry on as for any carp or fancy goldfish. These fish have a resemblance to Higo but appear to be rather less deep in body. There are many attractive colours in these fishes and they have a pair of barbels like the Higo.

TROPICAL QUERIES

Is it true that glass wool used to pack a filter can kill fish?

It is a fact that tiny splinters of glass wool sometimes find their way into the gills and intestines of fish. It is far safer to use one of the synthetic fibres such as nylon in an aquarium filter.

A few weeks ago I read a travel book in which I came across a reference to a South American catfish called a Hassar. Please give me the scientific name of this fish.

The Hassar is one of the armoured catfish. It is known to ichthyologists as Callichthyus callichthus and is widespread over South America. It is one of the oldest aquarium fishes known, and attains about 5 to 6 in. in captivity against about 7 in. in the wild.

I have noticed quite a few hydras in our aquarium and have been told that a few species of fish will eat them. Will you kindly give me the name of a peaceful fish that will eat the hydras but not eat or molest the other fishes?

The blue gourami will eat hydras if there is nothing better available. We have also read that the snail called Lymnaea stagnalis will help to keep hydras in check.

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TROPICAL Queries

continued from page 371

One of my rosy barbs suffers from constipation, and I was told by a friend to feed it on dried food soaked in medicinal paraffin. Although the fish has undoubtedly benefited from the treatment, the surface of the water is now spotted with ugly patches of oil. How can I remove the oil from the water? Also, if there is a less messy way of treating constipation in fish, I would be glad to hear of it.

You can clear the water of oil by drawing pieces of newspaper across it. As for the second part of your question, refrain from giving the constipated fish any dried food for a week or two, but see that it gets its fill of chopped earthworms, washed, minced liver (uncooked), and live Daphnia, all of which possess laxative qualities.

Are the tiny maggots found in toadstools and field mushrooms any use as a food for fish? If so, can you tell me a way to make them emerge from the fleshy tissues?

The maggots found in the tissues of edible and poisonous fungi make a useful food for fish. If you place a magneto toadstool or mushroom in a saucer of water the maggots will wriggle out of their hiding places in the proverbial no time.

Please give me some tips on breeding Camming's barb.

A tank measuring 18 in. × 12 in. × 12 in. or more is of paramount importance. It should be filled with clean water—free of all floating sediment—and maintained at a temperature of about 78°F. (26°C.). A soft, slightly acid water is recommended. The lighting should be good. Some bunches of a fine-folaged water plant, or scalded coconut fibre, must be anchored to the bottom to hold the sticky eggs. Separation of the sexes for a few days prior to placing them together is advisable. If egg-laying takes place, the place should be removed to fresh quarters as soon as the excitement of the chase is over.

The eggs take about 36 hrs. to hatch out. Three days later the fry will be looking for food. Large infusoriae, microworms, and flour-fine dried food can be given from the start.

I introduced some rather fine red ramshorn snails into my aquarium about two months ago but at the time of writing hardly one of them looks the same. Most have ugly grey fissures and pits on the shell. What is the cause of this?

We would say the water is too soft and acid for the snails. Snails need limey water to maintain their shells in fine condition.

I have just bought two Barbus orbiculus. Please tell me where this species is found in the natural state and what length will it reach in a well-aerated, spacious aquarium?

*B. orbiculus* is native to Thailand and Indonesia. Ordinarily this species stops growing when it reaches about 6 in. but with plenty of swimming space and the best of food it is not unlikely that it will grow a couple of inches more.

What is the temperature tolerance of the Malayan livebearing snail (*Melanoides tuberculata*)?

This snail, which some authorities say should now be referred to the genus *Melanoides*, has a temperature tolerance of from about 66°F. (19°C.) to 90°F. (32°C.).

Please give me some hints with regard to the cultivation of four-leaved clover (*Marliacea*).

The so-called four-leaved clovers flourish best when they are given soft and slightly acid water no deeper than the tallest of the unrolled stems, a gritty, peaty compost, and a reasonably bright, but not too bright, light.

To settle an argument I should like to know how far can an archer fish spit out drops of water to bring down its prey?

The archer fish is capable of spitting drops of water for several feet, but as a rule the operative distance is from a few inches to about three feet. Within the limits of this range, the fish is remarkably accurate. The writer of this note has often been "hit" by an archer fish at a distance of about five feet.

I have a pair of the rare *Neolobios annectens* from tropical Africa. Is it true that this lovely little characin is most reluctant to breed in captivity?

Firstly, *N. annectens* has been removed from the family *Clariasdae* and is now referred to the closely related *Clariidae*. It is far from a ready spawner, and even when it lays eggs the fry are difficult to raise to maturity.

It is true that if about one-third of the water in a long-established aquarium is drawn off and replaced with fresh always an improvement in the health of the fishes is obtained.

Very long-standing aquarium water does tend to become overcharged with nitrates produced by the decay of vegetation, the waste products of the fish, and so on and so on, and if this condition is not relieved by efficient filtration and/or changes of water every so often, then the health of the fishes will suffer. Commonsense, however, demands that the size of the aquarium should be taken into account when any changes of water are made. In a small aquarium only a quarter of the water should be removed at a time. Another point to bear in mind is to run in fresh water of a type suited to the occupants of the tank, that is to say soft water for soft water species and hard water for hard water species. And made certain, also, that the temperature of the fresh water is the same as the temperature of the aquarium.

Will a spiny eel (*Monacanthus aculeatus*) prove aggressive in a community tank, and what food does it like best?

Spiny eels in their smaller sizes (up to about 7 in.) are not interested in other fishes and keep out of their way as much as possible. But large specimens of a foot or more in length are not to be trusted with any fishes that are small, slim, and therefore swallowable. M. aculeatus flourishes best on live Daphnia and worms (white worms, sludge worms, and earthworms) and tiny pieces of raw meat dropped just in front of its nose. If live food is introduced into the tank for this fish's special benefit, see that it is given after dark or else the other fishes will eat the lot before the spiny eel has a chance to emerge from its hiding place.

Please give me some information about the likes and dislikes and breeding procedure of the black phantom tetra (*Melanophlebion nigripinnis*) from Brazil.

There is nothing very special about the black phantom tetra. Provided you give it soft, neutral to acid water, a temperature range of from about 72°F. (22°C.) to 78°F. (26°C.) and the usual live and dried foods, you can hardly go wrong. It is quite a ready spawner and deposits eggs on branches of nitzia, milfoil, and the like, or suitable substrates. The eggs hatch within two days but, as with so many other tetras, too much light and bacteria-breeding debris on the bottom will spoil the chances of success.

I have been told that the Australian rainbow fish (*Melanotaenia splendida*) may be kept and bred outdoors in this country. Is this correct?

About the end of May, when all danger of frost is over, and provided the fish have been gradually accustomed to living at temperatures in the sixties (°F.), an outdoor pool,
Deep in the centre for extra protection against a dangerous drop in the temperature (some May and early June nights can be very cold), may be used for keeping and breeding *M. migrans*. If all water snails are cleared out and no other fishes are present and there is a tangle of plants such as calitische or potamogeon growing up from the bottom, there is every hope of netting some well-developed fry before September is out.

Can your experts tell me anything about the sickle barb?

The sickle barb is a diminutive barb from East Africa. You will find it described under the scientific name of *Barbus* or *Puntius nöbleri* in some up-to-date reference book. It has been known to German aquarists since the 1930's. It has barbels, it eats anything, and although it will breed in captivity, it is not a ready spawner. It is prettily marked with a purplish to violet stripe along the translucent greenish to brownish sides.

Which is the true gold barb, *B. schuberti* or *B. gelius*?

Strictly speaking, Schubert's barb is more entitled to the common name of golden barb than *B. gelius*; but *B. gelius* is only bright gold under reflected light. But as *B. gelius* was given the common name of golden barb long before Schubert's barb came on the market, then, presumably, *B. gelius* has prior claim to the title. But mention of names raises the interesting question that, perhaps, the fish said to have been developed from a gold coloured sport of *B. semilasciolatus*, to wit, Schubert's barb, is not a man-made fish at all, but a little known species of barb from the Malay Peninsula, with the scientific name of *B. sachs*. And one thing more, it is wrong to allude to a 'man-made' fish by a scientific name.

I am a beginner in tropical fishkeeping and have just set up a small tank and stocked it with a trio of black mollies. When may I expect the first batch of fry?

You may expect some fry some eight weeks after the male has performed his duty. But mollies, unlike so many other popular livebearers, often go for several weeks without producing young. A point to bear in mind, too, is that mollies breed fastest when they are given plenty of swimming space in slightly saline water maintained at a temperature of about 77°F. (26°C).

A member of my local club told me that some barbs of the tropics grow so large that it would be impossible to accommodate them in a home aquarium. Can you give me any idea as to the size these monsters grow?

The largest barb that we know of is *Barbus tor*, the mahseer of India. This fellow grows to a length of 6 ft.

Could you give me the name of a puffer fish that will behave itself in a community tank?

The attractively marked puffer fishes known under the scientific names of *Tetraodon schudendi* and *Tetraodon or Carinotetraodon somphongsi* are well suited to a community tank because they do not need salt in the water, are easy to feed, do not snap at other fishes, and do not grow much larger than 2½ in.

Why is it necessary to allow tap water to stand for a while in a newly set up aquarium before introducing any fish?

It is not absolutely necessary but it is certainly advisable to let mains water stand for a few days before placing any fish in it; for during the process of pouring and ageing piped water loses the chlorine it starts out with to destroy bacteria inimical to the health of human beings.

**Fresh eggs for fishes**

by Leon Thorns

Have you ever seen across an ant's "nest" in the garden and wanted to use the so-called "eggs" as a method to keep for your fish? Unfortunately, more often than not such a "nest" is disturbed whilst digging and it is a intolerable task to separate the eggs from the ants and the larvae.

However, why not make the ants work for you? For want of a better method, which I have not yet discovered, this is how it can be done: using a small trowel, spread the whole ant hill over a sheet of thin paper, then put a small amount of fresh water on it and let it absorb the water thoroughly. After a while, remove the "nest", thus making the ants back to the inside of the hole, and take away the hill. Next, clear a small area in the centre of the hill and into this space put a small amount of fish food. If the ant hill is still not completely dry, the ants will be unable to live, and the ants will die, and the eggs will be safe. After a while, the eggs will hatch, and then you can use the fish eggs as you like.

**Stealing the ensmarer**

Another occasional source of "fresh eggs" is also to be found in the garden or the countryside, are the spiders which usually nursey their eggs in a large white silk-wrapped ball. These are usually found in old walls, bankside cavities, or in cavities under flat stones. If you are quick you can catch the speedy spider and carefully remove its nest from the ground, and then carefully peel off the top of the egg case. Several hundred tiny but highly acceptable eggs will then drop into the water.

Other species of web-building spiders' eggs are also to be found in corners of the garage or garden shed. These are usually more coiled and, though inclined to be "sticky", can sometimes be lifted away from the crevice with a pinknife blade and then opened over the top of the tank.

Since all our native spiders at least are acknowledged to be friends of man, it is not suggested that you specially hunt them out for the purpose of pilfering their eggs, but I think the enthusiast can be forgiven for snatching the opportunity when the occasion arises of providing a little change of diet for his fishes.

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Over forty years of fishkeeping

Mr. Alfred ("Nicky") Rous
of
"Queensborough Fisheries"

His first aquarium was a tin cabin-trunk. He acquired several more, all set out in the family garden, and five-years-old Nicky Rous was on his way to becoming an ardent aquarist. Then came a biting frost; the trunk-tanks were frozen solid and a small boy was wildly distressed until his parents and brothers saved the day, the fish, and his sanity by carrying the trunks indoors and thawing them out in front of the fire.

Alfred Rous has never forgotten that incident throughout his forty years of fishkeeping, which have brought him to a prominent place among the English aquarium authorities. His two retail shops in London and his extensive fish farm at Wraysbury are evidence of his success as a businessman, but he insists that this was never his purpose. Commercial success came naturally and almost unconsciously as a consequence of his passionate interest in fishkeeping, indeed in any and every aspect of nature-in-growth.

Passionate? Not too strong a term for the quiet man of professional bearing who will take infinite pains to care for the tiniest guppy, stop in his tracks to tend an apparently ailing fish among the thousands in his care, and raise the roof at London Airport when a consignment of tropicals has been delayed and the fish are suffering.

Long before the early agony of the frozen trunk-tanks he was absorbed in living things and his earliest ambition was to have a farm or a zoo. A manageable alternative at that early age was fishkeeping, and at the age of eight he was breeding goldfish and operating his own barter system, swapping the excess fish for marbles, conkers, and other juvenile treasures.

At fourteen he met a man who was to have a strong influence on his future, and who channelled his natural interests on to a clear course. He was Mr. Van Hal, a Dutchman with a tiny shop in the Portobello Road and one of the first to introduce tropica"ls into the country. He was also the pioneer of the cylinder-type heaters that are now widely established. Nicky Rous was a regular visitor to the Van Hal shop, bringing supplies form his own growing aquarium and taking away new specimens and a fund of expert knowledge from his mentor.

The teens years brought steady expansion in stock and know-how, and the beginnings of his business began to take shape—though he was still essentially an aquarist rather than a businessman. These were difficult days, when fishkeeping was limited to the common types. Neons and cardinals were rare, and the range of appliances rather primitive by today's standards. Nightlights were used for heating the tanks, which were mounted on shallow boxes with a glass panel. The nightlight was placed inside, and heat control was a matter of raising or lowering the light, or adding more of them in cold weather.

The war put an end to the first phase of this promising career. Nicky Rous disposed of his collection, went off to active service, and returned with a handicap of war
injuries to find that his home had been bombèd out. He went to live with his aunt at Queensborough Terrace in Bayswater, unaware that he was to take the name "Queensborough" and make it a household word as the title of his well-known fish farm at Wraysbury and of his business.

It all began again with a birthday present from his aunt—three pairs of fish, including a swordtail, bought from his old friend, Van Hal. He began to breed goldfish, supplementing his stock with the progeny of some old favourites. In disposing of his fish before the war he had presented a number of goldfish to the keepers of the sunken gardens in Kensington Gardens. They had multiplied magnificently during his absence, and the keepers were only too pleased to return the favour.

This was a time when goldfish were almost unobtainable, and there began a thriving business in a basement room of the house in Bayswater. He was soon producing some 5,000 fish each week, and that busy basement aquarium is still remembered by many of the enthusiasts who crowded into it. Among them was Mr. Charles Schiller, the "Father of Fishkeepers," who would buy up to two thousand fish in a single visit.

Prices were high in those days. Neons sold for £5 each, Angles 25s., Tiger Bars 12s. 6d. Nicky Rous began to specialise in Widows, and soon became known as "The Widow King." This species was selling at 5s. each.

Visitors are fascinated with the variety of fish and plants to be seen at Queensborough House. Here Mr. Rous and his staff introduce a group to one of the attractions in the ponds to the wholesale trade, and in the general buoyance of business the shop in the basement began to burst at the seams. The next step was the opening of the first of his retail shops in Shepherds Bush, followed soon after by the second in the West End.

The third and major development came twelve years ago, when the charming riverside property at Wraysbury was acquired and given its new name of Queensborough House. This delightful area of seven acres, with its century-old home and outbuildings set in the woodlands fringing the Coln Brook and the Thames, offered an irresistible challenge to its new owner. How that challenge was met and mastered is to be seen at Queensborough to-day, with its great fish-houses, ponds, hatcheries, and the many other attractions that bring buyers and visitors thronging to it every week-end. Whatever the weather, they come in their thousands and it is no novelty to see husbands carrying their wives through the deep snow down Ferry Lane to the fish farm.

The kiddies come eagerly, too; for there are other favourites besides fish. There is Ko-Ko, the impish

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little monkey; David, the donkey; there are lambs, birds, and in summer there are peacocks preening and posing on the lawns, where picnic tables are set out under the trees and from where visitors may take a boat on the river. Soon it is hoped to have a licensed restaurant, and other amenities are being planned to make a visit to Queensborough even more memorable.

Talking with Alfred Rous at his Wraybury home, as I did, leaves no uncertainty concerning the man and his philosophy. He is positive in opinion, dedicated in purpose, and deeply involved in the pattern of living things.

"I'm fortunate," he said, "I seem to have an affinity for growth. In the garden I stick in a twig and it thrives; I breed fish and they multiply; I follow a natural inclination and it builds up into a large business. Commercial expansion has never been a deliberate aim; it's the outcome of a natural concern—an instinct, if you like—for everything in nature that grows. I sometimes wish I could cut loose from it, but I can't. People say I own Queensborough Fisheries, and they're quite right; it owns me, and I'm simply the keeper of everything here."

He has no hobbies, few other interests beyond the activities that keep him busy around his fisheries. His concern is always for these living things, whether it is in raising the aquatic plants which he sells by the ton, or in hand-feeding the fish in the ponds where they come to him quite readily. ("The Italian fish are fed on spaghetti—they love it.")

He dislikes the sudden booms that sweep into the aquarium trade when fishkeeping becomes a fashion and fish are tumbled into tanks to meet the demand, with little regard for their quality and condition. Poor fish kept in make-shift conditions will die, he pointed out, and the public become disillusioned and their interest dies too.

He is strongly in favour of holding fish back from sale until they are well established and free from disease, and of ensuring that when fish are sold, the necessary information for keeping them healthy goes with them. In this respect he is kept busy answering queries and solving problems from people all over the country.

A visit to Queensborough Fisheries is an enchanting experience for anyone of any age; for the aquarist, it is an education and an inspiration to browse around this huge collection and to talk with the man to whom it has been a complete fulfilment for over forty years.

W.J.Y.

THE AQUARIST
What is your opinion?

by B. Whiteside

A NUMBER of letters were late in reaching me because of some delay in the Christmas mail so I am including these in this article.

The letters concerned live foods and plants for the cold water aquarium, and Mr. M. A. Conroy of Bournemouth, Hants., says that there is always the possibility of introducing water enemies and diseases into the aquarium with *tubifex*, *daphnia* etc. However, Mr. Conroy's favourite food for the fish is *tubifex*. He supplements this with *daphnia* and young guppies when they are available.

Mr. Conroy thoroughly washes the *tubifex* under running water, for a few hours, and then puts a quantity of methylene blue in with them, overnight. This, he finds, keeps a lot of pests and diseases out although it is not foolproof. He also finds it advisable to keep some leeches or catfish in tanks where *tubifex* are fed, so that they can ferret out any worms out of the gravel.

Being a town dweller, Mr. I. W. Gray, of Hull, can only get live foods which he grows himself, or buys from his local dealers. *Daphnia* he finds best, being free moving. As he specialises in Characins which, he says, are mainly middle tank swimmers, the *daphnia* stay in the middle water longer. Mr. Gray also feeds *tubifex* and whiteworm but some always reach the bottom where they dig into the gravel, die and decay, thus spoiling good tanks.

From Newcastle, Staffs., Mr. D. S. Woodvine writes to say that earthworms are greedily eaten by all fish large enough to take them. *Tubifex* are also eaten and Mr. Woodvine's fish have had no trouble with sores or boils. *Daphnia* are eaten by his smaller fish but fish of 4 in. or over do not seem too fussy, probably because too many *daphnia* have to be eaten for a good feed. Whiteworms are taken by fishes of all sizes but Mr. Woodvine gets some cloudiness in the water from the breakfast cereal on which he feeds the worms. All of his fish seem to grow very well on this diet plus a good dried food.

Mr. P. Fountain, of Somersham, Hunts., gives the sensible view that there cannot be one live food suitable for all sizes of adult fish. In his opinion, brine shrimp and cyclops would be very suitable for small species or those with small mouths. *Daphnia* is suited to the majority of average sized aquarium fish. For larger species such as Cichlids, mosquito larvae and phantom larvae are more bulky and satisfy larger appetites more easily than smaller live foods. Mr. Fountain does not use *tubifex* because the worms are found in such dirty places, and he thinks that they are possibly the cause of quite a number of the mystery deaths in aquarium fish. Although he has not used them, Mr. Fountain thinks that maggots and mealworms would seem to be suitable for very large fish.

Brockenhurst, Hants., is the home of Mr. D. Letts, who writes about coldwater plants. He thinks that the main problem with the coldwater aquarium is to find a long rooted plant which can, when properly planted and established, resist the attempts of the fish to uproot it from the gravel when the fish feed from it during normal food hunting. A good way he finds, is to plant an *Elodea* or *Cabomba* weighted with lead. These plants will grow rampantly without rooting and a good depth of gravel, plus the lead, succeed in keeping the plants in place. He has used *Sagittaria* with reasonable success but the shallow planting necessary for this plant is an obvious difficulty.

Mr. Letts has recently acclimatised a giant Amazon sword from the tropical to the coldwater aquarium and the Fantails and Shubunkins are having great difficulty in digging it up. He goes on to say that people seem to think that plants in a coldwater aquarium will grow without lighting, but in fact they need the same as their tropical counterparts. The writer of the letter goes on to ask why people shy away from the coldwater side of the hobby. “Perhaps because it does not seem so glamorous?” he asks. He goes on to say that the tropical enthusiast would be quite surprised with, for example, a couple of pairs of veils, fantails or moors in a reasonable sized aquarium, preferably with filtration and those deep rooted plants. Mr. Letts ends by asking if anyone can solve the problem of keeping a kingfisher away from a garden pond, without using netting?

Postal Services for the aquarist and filter media were the subjects for discussion for this article.

Sixteen years old Anthony Coles from Maidstone, Kent, has written to many firms which advertise and has found that he can judge a firm by the number of days the firm takes to answer his letter. He grades firms thus; by return of post, or after a few days—an interested, efficient firm; after a week—unless a satisfactory excuse is offered, an uninterested firm; after a fortnight—unless a really good excuse is offered, the firm seems very rude, especially when many ask for a S.A.E. Master Coles also judging them by the amount of information they supply. He states that interested firms give full details even without being specifically asked and that uninterested firms do not.

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He usually finds that goods are sent by return of post, if he orders something, or that if an item is out of stock, that he receives a note to this effect by return of post.

Mr. D. R. Hubble, of Sheppey, Kent, receives large numbers of fish from a well known "Victorian" firm and is satisfied. He points out that anyone who expects one hundred fish picked by any shop, to compete with four to six fish picked by ones self is a fool. He expects the odd fish to have travelled badly. On the question of filter media, Mr. Hubble writes "NONE". He favours decorative tanks and will never admit to the necessity for artificial filtering or aeration in the "balanced aquarium." He has kept tanks containing only burrowing snails and has often done without these. In sixteen years, he is convinced that balanced and correct feeding is the secret. He does say, however, that in tanks kept for reasons other than aesthetic ones, the filter is often the only solution to the problem of cleanliness.

Mr. S. Goodwin, of Congleton, Cheshire, says that he obtained virtually all of his equipment from postal firms and has never had a complaint to make. He also obtained all kinds of advice and has profited greatly from it. He thinks that the competition for orders from the postal firms keeps them up to scratch, unlike some pet-shops. He is not using any filters at present as he has a lot of plants which seem to keep his tanks clean enough. When using outside filters he uses nylon wool, carbon and aquarium gravel. He thinks that far too many people rely on filters and says that quite a few plants could be bought for the price of a decent filter. He has only really had to use a filter with cold water fish which kept uprooting the plants, but thinks that his tank may also have been overcrowded.

Mr. P. Brown writes from St. Helens, Lancs, and suggests that we should think about which filter material would be best for our type of filter. Glass wool is all right, he says, but it tends to disintegrate when boiled or washed. Nylon wool, he thinks, is the best medium as it does not dag easily and can be boiled and washed many times. He never uses peat in the filter as he thinks that it is of greater benefit to the plants, under the gravel. He also uses charcoal to remove unwanted gases from the water. He suggests that charcoal and carbon should not be used if one wants brown water to stay brown. He also informs us that a branded make of filter medium is extremely useful for its purpose in both salt and freshwater tanks.

Mr. G. Wayhrt, from Midhurst, begins his letter by saying that he lives "in the wilds" and must depend upon the post for everything. He finds that he gets a very good service indeed from advertisers in The Aquarist but finds that some do charge a little on the heavy side on postage (Very true. B.W.). He had some trouble with a heater/thermostat unit and could have been in real trouble but a letter to the suppliers got him a new unit by return, without any request to see the faulty one, thus saving his tank of fish. He finds one large firm very good for delivery of fish by post and rail.

Mr. E. J. Thompson, of Barton-on-Humber, Lincolnshire, finds that the letters sent by readers to this feature, are a veritable mine of information as he is a novice.

When he started the hobby he wrote to several firms enquiring about tanks, plants, heaters, etc., and without exception, he received replies within four days. Each reply was very explicit and extremely helpful. Items later ordered arrived without delay except for the tank and hood which took British Railways ten days to deliver. Mr. Thompson was much impressed by the service and help given by the firms and will order from them again as he sets up more tanks. He does not use filters as he does not think them necessary in his thirty gallon tank. He has a large collection of plants and uses gentle, continuous aeration which, he finds, leaves his tank needing little maintenance.

The following are some questions, sent in by some of the above letter writers, for answering in the next "What Is Your Opinion?":

1. What do you understand by the word "Calaree" as applied to our hobby? (Asked by Mr. Hubble.)
2. What conditions do you provide for your Discus?
3. What do you think of freeze-dried fish foods? (Both asked by Master A. Coles.)
4. What type of artificial lighting do readers find most beneficial to their plants?
5. Have you found that some aquarium plants do not grow, or die off, in the presence of others? (Both sent by Mr. E. J. Thompson.)

Please send your opinions on the above subjects as soon as possible, and print your name clearly on your letter. Letters arriving too late for publication may have to be omitted or held over to a later issue.
Setting up a furnished tank for competition

by A. Boarder

Hints on design, size, rocks and compost, choice of fish and plants and show preparation

The furnished tank will always be the most outstanding feature of any aquarist show, especially for the ordinary visitors who may not be dedicated aquarists. A row of well set-up tanks is a great attraction and will generally have a small group of admirers constantly around such tanks. The first British Aquarists' Festival at Manchester in 1951, had a splendid row of furnished tanks which proved a very big attraction and was one of the finest collections of such tanks I have ever seen. There was plenty of variety among them and one or two of rather exceptional design. I well remember the one which had a very realistic impression of a cave complete with stalactites and stalagmites; unfortunately, when the heater was switched on the candle grease, with which it was made, melted and the whole tank became a thorough mess.

One still sees a few unusual designs as some exhibitors are rather impressed by the fact that five points can be allotted for originality. This could be carried too far as if one tried to imitate a village pond and displayed an old boot in the tank, this might not find favour with the judges. Nowadays, it is rather difficult to find something really original which is likely to be accepted and so it may be better to stick to a more formal design and concentrate on obtaining the finest living picture possible.

Before entering for such a competition one must make enquiries of the society as to the sizes of tanks to be used. This is most important. There are two sizes usually found and they are provided by the society. They are the 24 x 12 x 12 in., and 24 x 12 x 15 in. The latter, being deeper, is to be preferred to the former as it enables one to use much better specimens of plants. If the size of the tanks is not known beforehand one could take plants which were too tall for the smaller tank.

Some societies provide compost but I would always recommend the exhibitor to take his own. I consider that to have a badly matched compost is a sure way of not only spoiling the whole effect but it will usually mean the loss of marks. Also it is most essential that the compost should be thoroughly clean as once the tank is filled with water, some of the fine material in the compost could cloud the water and again lose valuable points. Not only this but many tanks I have seen have had such a bad contrast of colour between the rocks and the compost that the first impressions are fatal, and the judge would no award such a tank many points for general appearance or for rockwork and compost.

Before the show, any compost to be taken must be cleaned well and the rocks inspected closely. Any sharp points or edges must be removed and the scrapings might well be used to lay on the compost near the rocks to give a natural decomposed look. Rocks are not compulsory in the tank but I have rarely seen a really attractive tank without one or two well seasoned and coloured rocks. No rocks of a limestone nature should be used and a good weathered Westmorland rocky stone type will often be a very good choice. Where the rocks have a distinctive colour it is well to provide a base compost which is in keeping and if not quite matching in colour it can be rendered so by broken pieces from the actual rocks. I have seen some composts which are composed of many tiny pebbles in soft tones and this has added to the general picture considerably.

The rocks and compost having been decided upon, it is now necessary to choose the plants most suitable for the general set up. Points are awarded for the choice of plants but this does not necessarily mean that the more kinds there are the higher will be the number of points awarded. When choosing the plants, try to include those of differing colours, such as pale green, dark green and reddish or brown. With the right choice of plants, rocks and compost it is possible to complete a perfect picture so that when the fishes are added the whole set up will be most attractive. Sometimes the type of plants can be chosen to suit the fishes which are to be included and certain fishes may look best in a tank with plenty of tall narrow-leaved plants such as Vallisneria or Sagittaria natans. Your choice of plants should include some strong growing types such as Lagarosiphon major to hide the back corners of the tank. Some shorter types can be placed in the mid-distance with a few small growing ones for near the front of the tank. This front planting must not be overdone as such plants could hide the beauty of the rocks or prevent the fishes from getting swimming space.

The fishes to be used in the exhibition tank must be carefully chosen. It is not always beneficial to include many different species and some of the most attractive

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Piranhas

I WAS surprised by the advice given in the January issue not to keep two piranhas together. My husband and I purchased two piranha fry at the Belle Vue exhibition in October, 1966 and since then the two fish have been constantly together without damage to either. It is interesting to note that they have dug into the gravel in a rear corner of their tank deep enough to expose the under gravel filter and there they spend a great deal of time motionless. Their food (chopped meat, tubifex and white worms) is dropped thrice daily onto a piece of slate at the front of the tank over which they take turns to hover—they are never out in front together but alternate between the hole at the rear and the slate at the front. Algae is a problem as they eat snails—in fact they attacked a giant Australian snail we introduced to try to cut down the algae and it had to be removed from the tank. When any attempt is made to clean the tank they become most agitated and, after swimming madly back and forth sometimes hitting the glass, they go into a sort of catatonic trance lasting up to three hours.

I would be most interested to hear from anyone keeping these fish.

MRS. S. ARROW,
Ipswich, Suffolk.

Can you help?

I AM very sorry to hear from you that the January, 1968 issue is already out of print. I would like to receive a letter from any of your world-wide readers, telling me that they are willing to post me the January issue, 1968. I am willing to pay for the issue, and its postage. Hoping to hear from any of your readers, telling me that they do not need it any more. I would reply to the first letter received.

Yours faithfully,

JOSEPH JOHN MELLI,
"Pat House," Church Street,
Paceville, St. Julians, Malta.
Concrete Tanks

WITH reference to Mr. A. Boarder's article on concrete tanks, I would like to point out an easy method to remove the inside former (see sketch).

If side 1 is prised inwards at point A, followed by end 1 at B, and side 2 at C, and finally end 2 will fall out. This may seem rather complicated but this is the usual method used in shuttering and would prove beneficial when constructing a large tank.

After reading some four other magazines I find yours very interesting and informative.

E. MYER
Newport, Mon.

Lemon-Finned Barb

THROUGH the year I have followed with interest the "Champion of Champions" Contest. At Manchester like thousands of other Aquariums, I looked in awe at the magnificent winner, the Lemon-Finned Barb belonging to Mr. Bill Parkin.

One thing, however, mystifies me, can I find no reference to this fish in any of the more usual reference books.

Please publish the scientific name also some details of its characteristics.

Yours faithfully,
D. R. LElliOTT
St. Albans, Herts.

We have directed enquiries concerning the specific name of this fish to the British Museum but from the evidence supplied by us in the form of a photograph of the Champion of Champions, that establishment has not been able, so far, to supply any specific identification but would welcome the receipt of a live or dead specimen to further their research.

—EDITOR.

Annual Fish

SO-CALLED "annual" fish (Aphymisom spp., Notobranchius, Cynolebias) are probably the shortest-lived and most rapidly-aging vertebrates. For this reason they have become important for research into the nature of age processes. This Group would very much like to recruit the help of aquarists in constructing survival curves for males and females of any species in this genera.

Ideally, we would like anyone who Rear a sizeable brood of killies to observe them until natural death, recording the sex and date of death of each individual, together with other details (whether bred from...
A living coral aquarium

by D. W. Sanderson

After serving for three years in Cyprus with a British Army School, during which time I kept two tanks of Mediterranean fish (Aquarist, Feb., 1964) I was transferred to Malaya at short notice. Apart from relief at getting away from an increasingly unpleasant situation in Cyprus and the prospect of being reunited with my evacuated family, thoughts of future marine aquaria were already in my mind.

Kuala Lumpur, to which I was posted, is only twenty miles from the sea, but seventy miles from the nearest coral reef where I hoped to catch my fish. However, it had other advantages, as I was soon to learn. Whereas in Cyprus I had been working completely alone, without even a shop from which to buy equipment, in Kuala Lumpur there seemed to be an aquarium shop on nearly every street. These were owned and patronised almost entirely by the Chinese community amongst whom the aquarium hobby is extremely popular.

I had no difficulty in getting a tank for marines. Locally made cement tanks were both plentiful and cheap. On the advice of a dealer I bought a second-hand one which was well seasoned. Before long I had it set up in the way in which had proved so successful in Cyprus—a large outside filter taking water from one end and returning it at the other, an airstone to make the water surface really move, and just a bare covering of sand on the bottom of the tank.

In this first set-up I used rocks which had been carefully cleaned and sterilised. I tried curing my own coral pieces, but the first two attempts were complete failures.
and resulted in the loss of several fish within a very short time. I eventually managed to make the now "clean" coral safe, by soaking it in bleach for a week, and then soaking it in fresh water which was changed every day for a fortnight.

It was on my coral collecting and fishing expeditions that I was struck by the fascinating beauty of the living reef. There was no comparison between this intricate world and the sterile affair that was my aquarium. I just had to take some coral home alive and try it in my tank. I collected some small pieces of *Goniopora malacensis* and transported them in a wide polystyrene bowl, being very careful to see that they did not knock against each other. The tank was in perfect condition when I put them in, but they were dead within a week.

When I set up a second tank I tried the living coral again in freshly collected water. This time it lasted two weeks. Replacements in the same water lasted only three days. As corals are plankton feeders it did seem rather unreasonable to expect them to live in water which was going through a filter about once every hour.

I had read about the "natural method" used by Lee Ching Eng in Djakarta, but as the only communication with Djakarta at that time was via the parasprites and commanders, which were being dropped on us, it did not seem to be a good time to get in touch with him. Secondly, I felt that this method was rather "chancy" and that seventy miles was too far to keep on bringing coral for experiments which seemed likely to fail.

A compromise was needed and an undergravel filter seemed to fill the bill. It would keep the water crystal clear without actually removing anything from the tank. I decided that I would first find out as much as possible about the use of undergravel filters in marine tanks before going ahead and trying one. I consulted all the books and magazines at my disposal and wrote numerous letters.

"The following extracts summarise my findings:"

"I see no reason why an undergravel filter should not work in a marine tank".—Dr. Wilson, Director of the Marine Biological Association.

"Sub-sand filters are to be recommended, since they do both jobs at once," (i.e., aerate and filter).—J.S. Vineen, F.Z.S. in the Pan Book of the Home Aquarium.

"Sub-sand filters may be used, but in addition I would use a good outside filter".—Alfred A. Shultz in T.F.H.

"Sub-gravel filters must never be used".—Leaflet published by Tropicarium, Frankfurt.

"First, use an undergravel filter and cover it with several inches of medium-coarse beach sand".—Bob & Don Morris, Fish exporters of Hawaii.

It was not until much later that I discovered that the clue to success lay in the last three words of Bob & Don Morris. Sand, not gravel, must be used with these filters in a marine tank. This means that waste material will collect on, not in, the sand and can easily be cleared away with a sediment remover.

My new set-up with the sub-sand filters worked well and the corals I collected seemed to thrive. After several attempts to feed them, I discovered that they were feeding themselves on the live food intended for the fish. This consisted of daphnia and mosquito larvae at first, and later brine shrimp, when dried eggs became available in the shops. Of the three, freshly hatched brine shrimp turned out to be the best.

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**Corals for the aquarium**

The best corals for the aquarium are those which have large distinct polyps whose activity can be clearly seen. Not only can the aquarist examine the individual polyps and watch them feed but their state of health is at once apparent, and any sickly specimens can be removed at once. These corals belong to the genus called *Goniopora*. *G. malacensis* seems to do best in an aquarium. This coral has long brown polyps which look like the tentacles of a sea anemone until examined closely. These polyps are capable of catching and eating mosquito larvae, daphnia and brine shrimp, and so help themselves whenever the fish are fed.

Another group of coral capable of feeding on these relatively large creatures are *Fungia* or *Mushroom corals*. These corals grow on a stalk when small, looking like small mushrooms. As they get larger the stalk breaks and they continue to live detached but sedentary upon the reef. They are in fact just a single large polyp and not a colony. They are corals such as *Porites* and *Montipora* did not do well. The stag horn coral (*Acropora variabilis*) so popular as a decoration when cleaned and dried did not live for more than a few days.

When coral was collected from the reef, the living part was often found to be attached to an even larger piece of dead coral. This dead portion had to be broken off cleanly, while taking care not to damage the living part. During transit the various pieces collected were not allowed to knock together or damage would have resulted causing the death of some of the polyps. Some corals, when picked up gave off a great deal of slime. These types did not seem suitable for the aquarium.

Some soft or leathery corals were kept as well as the hard varieties. *Alcyonium murale* was found to be extremely hardy and it is a very attractive growth when its tentacles are extended. Small colourful sponges were also kept for short periods. The corals *Goniopora* and *Fungia* were kept for periods of four to six months without changing any of the water. After six months new corals placed in the same water died within two weeks. In spite of feeding on brine shrimp it is apparent that corals need something which is found only in fresh ocean water. It is therefore a good idea to change part of the aquarium water (say 25% to 50%) about once a month.

The living coral aquarium provides a natural environment for its inhabitants. They settle down more quickly, behave more naturally and are more interesting to watch. A great deal can be learnt by regular observation of this type of aquarium, particularly if it is complemented by observation of the same species of fish in their natural environment on the coral reef.

April, 1968
Setting up a furnished tank

continued from page 379

tanks I have seen have contained just one shoal of one species. A tank with a small shoal of Tiger barbs is often very attractive especially if the plants have been well chosen. Such fishes will usually keep very active and be on view most of the time. There are, of course, many other species which will shoal well and look good. It is almost hopeless to include the types of fishes which persist in hiding behind the plants and just will not come out so that they can be judged. I have often had to leave such a tank for a long time when judging, in the hope that at least a few fish will become visible.

The size of the fishes is also of great importance as it is not a good idea to include large fishes with small ones. It is far better to try to keep all the fishes to about the same size. It is often possible to include a few which swim near the surface such as Zebras, some which may keep near the centre level and some, such as a loach or two, to occupy the base. With the small types of tropical it is well to use fish which are adult but, of course, this principle cannot be carried out with some of the coldwater fishes which would not be considered exhibition specimens until they were over a foot long. Very large fish would look quite out of place in a tank and I consider that with coldwater tanks three fish of not more than three inches long overall or two fish of four inches would be sufficient.

Before setting out for the show it is a good plan to work out a rough sketch as to how you intend to place the rocks and plants so that there will be no time wasted rearranging the tank when setting it up. The back of the tank should have a cover, such as coloured paper which can be fixed to the outside of back glass. The colour will be an individual choice but something should be applied to the back as nothing looks worse than to inspect a furnished tank and find that a shadow can be plainly seen through the one being examined.

Having arrived at the show, the previous night to judging, if possible, the tank should be inspected thoroughly to make sure that the front glass is perfectly clean. The show secretary will allot you a tank and then it is up to you. Having fitted the back paper in position the base compost must now be introduced. When doing so make sure that you are not using too much. Towards the back the depth does not matter very much, but at the front it should not come up above the front frame, or very little above it if at all. The more compost you have above the frame in the front the less of the picture will be left on view. A good plan is to heap the compost up higher at one end so that it is possible to have a broken level at the bottom.

Having roughly laid the base in position the rocks are the next to be positioned. Do not use such large ones that most of the swimming space is lost; to see a tank with almost nothing but large rocks in it will put a judge off from the first. Differing sizes of rocks should be used and if they have a natural strata visible these should all run one way. One fair sized rock with smaller ones graduating away from it can look well and if a small channel can be formed this can assist in creating a variation from any flatness or formality. Do not so place rocks that fishes could get trapped behind them or where there are so many hiding places that the fishes will rarely be seen.

Having decided on the position of the rockwork the planting will be the next task. This is a very important part of the work as even the best of plants will be of little value if they are not arranged to the best advantage. The first concern will be to cover the back angle iron at the corners. This can be done with the aid of good bunches of a strong growing plant such as Lagarosiphon major, or Cabomba if for a tropical tank. The plants must be well secured either by planting them under the edge of a rock or by lead strips well tied to the base and such anchorage well concealed in the compost. Suitable plants can be set behind the rocks to soften the appearance but if a channel has been left this should not be planted up except at the very back, and not then if the back cover is correctly coloured.

No roots of plants should be visible except of those plants which normally grow with the base of the root system just above ground level. The ends of the plant should be well planted and then a few of the smaller specimens can be set near the front. Try to plant these so that they look natural and those which grow with runners should have one specimen with smaller runners to the side in descending order of size. Do not stick small pieces of individual plants at regular intervals about the base of the tank. Try to make fair sized groups of each species and do not crowd them together so much that their beauty cannot be seen. An over- planted tank can be almost as bad as an under-planted one. Make sure that the plants chosen are in as near perfect condition as possible for the judges will usually look for broken pieces from the tops and holes made by snails.

Before any fishes are put in the tank make sure that the water is clear and that the plants will not have to be moved around again. Most exhibitors like to have about half the tank filled with water when setting up and the rest is then added carefully by pouring onto a flat board or similar object to prevent the compost from being disturbed. Once the tank is filled with water it may look very cloudy. It should then be carefully emptied and refilled. If the tank can be set up the night before judging it will give it time to settle down and for the water to become clear.

It is very difficult to set up a tank within a few hours of judging and have really clear water.

The temperature of the water should be carefully checked, not only for tropical fishes but also for coldwater specimens. The carrying out for coldwater fishes may have become warm and if the water in the tank is icy cold the fishes could easily get a shock which would put them off colour for the duration of the show. Once the whole set-up is to your liking it will be time for the introduction of the fishes. Do this as carefully as possible so that not only the tank but also the fishes will be subjected to as little disturbance as possible. If the fishes are scared badly they may dive behind the plants and be very lout to come out again.

Furnished tanks are usually judged by at least two judges and they may have differing ideas as to what is an attractive picture. Points will be awarded for the choice of fishes, their size in relation to the size of the tank and their quality. The plants will get a similar pointing, the choice, colour and condition of them and the way they are planted. The rocks and compost will be inspected and

Continued on page 385

THE AQUARIST
the arrangement of the rocks and the matching of the compost with them will be considered. It is certain that sharp edges will be down-pointed and also the tank could lose points if the rocks are too large and prominent. The clarity of the water can receive five points if perfect and the permanence of the tank will be considered. This can apply to the plants as well as to the fish. If too many vigorous plants have been included this could mean loss of points under this section as could overcrowding of fishes.

Once the water is of a satisfactory clarity the surface should be inspected. It is probable that there is a film on it or some small pieces of paper. A sheet of paper drawn across the top will usually clear this. The front glass should then be cleaned and the cover put into the most light points of the tank. At the passage of the lamps may be controlled by the society as it is well known that a couple of 100 watt lamps will make a tank look much more effective than one with 40 watt ones.

The use of well matured tree roots has been a feature in some cases but must be very old and they might make the water too acid for some fishes. The same can be said of the use of large pieces of bark. In most small shows all the furnished tanks are pointed by the judges, but where there are many it is possible that only the good ones will be so pointed. Any tank which is awarded 80 points or more will usually be in the cards. Points can be deducted for the wrong choice of fish. With tropica it is possible to find a large range of fishes which would be suitable but with the coldwater types there are not very many suitable species. The common goldfish, shubunkins and fantails would be a good choice as would orandas, although they might be good fish are usually very inactive in a tank.

Of the British freshwater fishes there is not a very large choice as some such as Trout would not be happy in a tank for long. Golden orfe could soon grow very large but very small ones could be used. Golden Rudd, if small would be a good choice as would Golden Tench. Bitterling carp would be good as a few would shoot up and look attractive. With a coldwater tank it will be necessary to use those fishes which are not only colourful but also move around well, and are not likely to become too large within a short space of time.

If aerators or heaters are used they should be placed in such a position that they are not too obvious or after the same applies to a thermometer. Remember that although you may have set up the tank perfectly it is possible that if the wrong fishes have been used they might soon mess up all the plants and spoil the whole look of the tank.

Some aquarists have a natural gift for setting-up a tank and such a member is usually to be found in every club. I have often noticed that some ladies are better at creating an attractive picture than many men. I do not think that anyone would be likely to win with a tank in a fair sized class if he had not had considerable experience in setting-up a furnished tank, and so any interested in furnishing would do well to visit a good show and examine the winning tanks carefully and so learn what is required.

**News from AQUARISTS’ SOCIETIES**

At the first February meeting of Swillington A.S. the Ladies’ Trophy for Chrysalis was won by Master Paul Stringer, 2. Mr. T. Bull, 3. Master M. Emmett. The President’s Trophy was awarded to Mr. Paul Reynolds for gaining the most points for shoaling at the exhibition during 1967.

The guest speaker at the second February meeting was Mr. L. Greenall of Tadcaster, and he gave an interesting lecture on the Breeding of Siamese Fishers. Winners for the Table Show were: 1. Mr. T. Bull; 2. G. Banks; 3. Mr. and Mrs. M. Linden; 3. G. Nash, Novices: 1. Mr. M. and Mrs. M. Linden; 2. Mr. and Mrs. M. Linden; 3. Messrs. J. and M. Linden.

**WINNERS of Club Annual Awards of the Reigate and Redhill A.S. for 1967 are as Follow:**

- Annual Presidents’ Trophy, Tropical: G. Biss; Coldwater: W. Litch; Novice Tropical: Margaret Nicoll. A. Burley Siamese Fighter Cup: A. Burley. Home Furnished Aquaria: P. Collins, W. Litch Breeder’s Cup Group: D. Miller (Babbing), G. Biss. The R. D. Barker-S. Magazine Award: G. Biss (suggestions, Mr. B. Orchard, member, who has given the most selfless service to the Club in the current year, W. Brookfield).

Earlier in February, Mr. R. Eason enlightened his audience on the mysteries of the study of heredity and variation in fish when he addressed the society on Genetics. Mr. C. A. T. Brown judged the Table Show, the results being: Chrysalis: 1 and 2, N. Packman; 3, G. Collins; Rasboras: 1 and 3, P. Young; 2, N. Packman. Angelina: 1, K. Wheatley; 2, J. Stump; 3, M. Nicoll.

Due to the resignation of the Society’s Chairman, G. B. Biss, for domestic reasons, A. Burens has taken the chair. Open Show will be held on the 19th September. Show Secretary: J. Stump, 14. Bonham’s Drive, Horbury, Surrey. (Tel.: Horbury 3249.)

The following officers were elected at the Annual General Meeting of the North Kent A.S.: Chairman: R. Bird; Secretary: Mr. B. Harvey; Treasurer: G. Sims; Committee Member: Mr. G. Banks. The meeting was held on the 18th September, Show Secretary: G. Sims.

**THE following officers were elected at the Annual General Meeting of the North Kent A.S.:**

- Chairman: R. Bird; Secretary: Mr. B. Harvey; Treasurer: G. Sims; Committee Member: Mr. G. Banks.

The meetings are held every Sunday at Swainley Primary School. Swainley, Kent. All visitors can be assured of a warm welcome.

**THE Annual General Meeting of the Burton and District A.S. took place recently at which some of the 1966 Committee members resigned. The remainder of the Committee were elected at subsequent meetings. The following were elected:**

- Chairman: Dr. D. Kilner; Vice-Chairman: J. B. Anckorn; Secretary: G. B. Biss; Treasurer: J. B. Anckorn; Equipment Officer: G. B. Biss; News Editor: B. W. Forman; Publicity Officer: J. B. Anckorn.

- **IN order to foster local interest in cultural pursuits and hobbies, the Arts and Crafts Section of the Redbridge Arts Council this year staged an exhibition as part of the Town’s Arts Festival, in which the Ilford and District Aquarist and Pondkeepers’ Society will be participating. The “Recreation Exhibition,” as it is to be called, is to be held in the Redbridge Town Hall, High Road, Ilford, from Wednesday, 1st May to Saturday, 4th May, both dates inclusive. Admission will be free. The hours of opening are from 12 noon until 9.30 p.m. each day and all day on Saturday.

At the first June meeting of the Society, a very informative programme on tropical and coldwater plants was presented by Mr. Pre of Runford. Mr. Pre has a large collection of coloured slides on this subject and his knowledgeable comments on these were of great value particularly to new members.

Programmes for the next few months are as follow—Monday, 8th April, 8 p.m., Auction of fish and plants, for members, Table Show—Any variety Plaups. Any variety Charcha. Monday, 15th May, 8 p.m., Coldwater fish and garden pools. Talk with slides, Table Show—Any variety Single tail Goldfish. Any variety Swordtail. Any variety Labyrinth. Anyone interested will be welcome to attend these meetings, and details of the Society can be obtained from the Secretary, R. Bish, 13, Durrand Road, Dagenham.

The monthly Bulletin of the Nottingham and District A.S. contains news of the activity of George Bulleymore, one of the Club stalwarts who passed away recently. He had been a member for over seven years, and his passing has caused a gap in the Society which will be very hard to fill.

At the January meeting there was a programme of slides with taped commentary entitled “The Life of the Betta Splendens.” Speakers were: J. S. Barnes; Mr. B. T. Lay; J. A. Saxton; J. S. Sutcliffe; 2 and 3, K. Biss. Lecturers: 1, P. Bailey, 2, D. Holland; 3, K. Biss.

At the Annual General Meeting of the Chapeltown and District Aquarist Society, the following officers were elected:
THE AQUARISt

A. S. Abdy, President; A. Hirst, Vice-President; S. W. Fearnhead, Show Secretary, L. Wren, J. Hodden, P. Adams, Committee, Mr. P. Adeney, Secretary; B. Redmond, Treasurer; S. W. Fearnhead, Show Secretary, L. Wren, J. Hodden, P. Adams, Committee, Mr. P. Adeney, Secretary; B. Redmond, Treasurer.

A decision was reached to hold twice monthly, instead of only once per month, and an all-out effort is to be made to increase the membership of the Society. The following events are to take place:

THE ELIZABETH Port Tropical Fish Society

- Held its 3rd annual meeting on Wednesday, 17th, with a substantial increase in the membership. The new members were welcomed by the Society for their support and attendance. A special prize was awarded to Mrs. Louise J. Bridges, which will be given to anyone interested in the Society for support and attendance. A special prize was awarded to Mrs. Louise J. Bridges, which will be given to anyone interested in the Society for support and attendance.

THE SHOW

- Held on Saturday, 19th, with a substantial increase in the membership. The new members were welcomed by the Society for their support and attendance. A special prize was awarded to Mrs. Louise J. Bridges, which will be given to anyone interested in the Society for support and attendance.

THE AQUARIUM

- Held on Saturday, 19th, with a substantial increase in the membership. The new members were welcomed by the Society for their support and attendance. A special prize was awarded to Mrs. Louise J. Bridges, which will be given to anyone interested in the Society for support and attendance.
OFFICERS for the Kingston and District A.S. this year are as follows: Chairman, D. Stewart; Treasurer, Mrs. R. Greenehall; Secretary, Miss E. Greenland, 39, Carthage, Moncton, N.B.; Honorary Directors, Mrs. C. Moore, Dresser; Miss E. Greenhall, 39, Carthage; Mrs. A. Davison; Mr. W. A. Brown; Publicity Officer, Mrs. K. Cassidy; Liaison Officers, G. Woodhouse; Delegates for the A.V.A.S. G. Whiteley and R. Boothroyd; Delegates for the F.N.A.S. G. W. Cooke and A. Bradley; Auditors, D. M. Croft and J. A. Thomas; Auditors, D. M. Croft and J. A. Thomas; Directors, Mrs. A. Davison, 21, Lower Town, Moncton; Miss E. Greenland, 39, Carthage; Mr. W. A. Brown, 18, 16th Ave., Moncton (previously held in September).

THE following is a report of the Mid-Halton A.S. activities for the last year that is to be published.

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discussion took place about the design and selection of the new Club badge. This was followed by comments and much favourable criticism of the awarding of a Medal to the First prize winner in each Table Show competition. Members then heard the Secretary, Mr. I. Andrews, read an invitation from Hounslow A.S. to arrange a derby's outing combined with a Boat Show, later in the year, the hospitality to be returned by Hounslow A.S. early in 1969.

The main item of the evening was a colour slide show by R. Marley, to whom much credit is due, as not only did he give a most comprehensive commentary but had over a period of years taken the pictures himself. During the interval the Table Show of the month was judged by J. V. Jeffery, with the following results: Swordtails: 1, R. Travers, 2, B. Poole; 3, Mr. Waddilove, 'Breeder's Club', Owners Prize: 1, Mr. Haggs (Angela); 2, Mr. Bever (Dewbra), 3, Mr. Stubb (White Cloud Mountain Minnows).

NEW SOCIETIES
The Falmouth and District A.S. has been formed recently and the following Officials elected: Chairman, M. Nicholson; Secretary, J. Taylor; Treasurer, Mrs. May. Show Secretary, Mr. A. Beals, Librarian, G. Symonds. Miss Atkinson will preside on the first and third Thursday of each month at the Falmouth Labour Club at 7.30 p.m., which is most welcome and should contact the Secretary, J. Taylor, 1, St. Anthony Road, Falmouth, Cornwall, or come along to any of the meetings.

A new club has been formed in South Wales known as the Longbridge and District A.S. The club is a spin-off from the recently formed River Taff A.S. The first meeting will be held in the Granby Road, Cardiff at 7.45 p.m. on Tuesday, 11th May. Details may be contacted from Mr. D. Meek, 36, Belle Vue Road, Grangetown, Cardiff.

A new aquatic society has been formed in Southport and is known as the Southport and District A.S. The first meeting will be held at the Southport Regatta Club, Park Road, Southport on Tuesday, 11th May at 7.30 p.m. Members are welcome, and details may be obtained from Mr. A. H. Edwards, 1, Selby Road, Southport.

The committee elected, were as follows: Chairman, Mrs. D. Meek, 36, Belle Vue Road, Grangetown, Cardiff; Secretary, L. Conant, 13, Cottage Lane, Marbrook, Bromsgrove, Worce.; Show Secretary, F. Massey; Treasurer, G. Shipman. Anyone interested in joining is most welcome, from beginners to experts, and should contact the Secretary.

On the 26th February the Meersbrook A.S. held their 10th Meeting, when the Annual General Meeting was held. A new club member was elected. The next meeting will be held on Tuesday, 11th May at 8 p.m. at the Meersbrook Park Vestry Hall. The next meeting will be on Thrusdays, 14th and 28th April. New members will be welcome, and details may be obtained by contacting the Secretary, J. M. Price, 641, London Road, Sheffield, S.5.

SECRETARY CHANGES

Burton and District A.S.: G. Dege, 189, Hawford Lane, Wincilfield, Burton-upon-Trent.


AQUARIIST CALENDAR
5th April: Belle Vue A.S. Open Show at Swindon and Cowan Social Club, Manchester.
6th April: Vallis A.S. Third Annual Open Show at Civitas Hall, Ramsholt. Schedules and entry forms are available from Mr. J. S. Hill, Show Secretary, 35, South Street, Ramsholt, Suffolk.
7th April: Stockbridge and District A.S. First Open Show, Victory Club, Manchester Road, Stockbridge, nr. Sheffield.
8th April: Nelson A.S. Annual Open Show at Neslon Civic Hall, 2 p.m. Details from B. D. Smith, Assistant Secretary. Tel. BLY 21930.
9th April: Thurrock A.S. First Open Show at Gypsy Lane, Grays, Essex. Show schedules can be obtained from D. C. M. Durrant, 22 Kingsmead Road, Stanford-le-Hope, Essex.
10th April: Stockton-on-Tees A.S. Third Open Show at St. Joseph's Church Hall, Norton. Schedules are now available from Mr. J. Chamberlain, Show Secretary, 35, Tower Street, Stockton-on-Tees.
12th April: Orton A.S. Annual Open Show at Orton Recreational Hall, Churchland Road, Orton, Oldham. Further information and entry forms can be obtained from Mr. D. E. G. Start, 53, Relieve Street, Show, Oldham.
13th April: Freelance A.S. Third Annual Open Show at the Hotel London of Printing, Elephant and Castle, London, S.E.1. Details and entry forms can be obtained from Show Secretary, Mr. A. H. Edwards, 1, Selby Road, Southport.
14th April: Trowbridge and District A.S. Open Show.
15th May: Derby Regent A.S. Open Show at the Engineers' Club, Ormonde Road, Derby.
16th May: Leicestershire A.S. Open Show at the Leicestershire Rugby Union F.C. Batemans, Pennington, Leicestershire. Schedules are available from Mr. D. Grundy, 96, Manchester Road, Tynelaise, Manchester.
17th May: Southport Aquarium & Zoological Society Annual Open Show. Venue to follow.
18th May: Bradford and District A.S. First Open Show.
19th May: Kingsdown A.S. First Annual Open Show (previously held in September).
20th May: Hull A.S. Annual Open Show at Hull docks. Schedules are available from Mr. H. R. Grant, 20, Dover Street, Reading.
22nd May: Kynham and District A.S. Open Show. Show Secretary, Mr. D. A. Gibbs, 57, Weavil Road, Hereford, Hereford.
23rd June: Bristol and District A.S. Open Show at St. Denys' Hall, Southamptom. Show Secretary, Mr. D. A. Gibbs, 57, Weavil Road, Hereford, Hereford.
24th June: Cardiff A.S. Open Show. Schedules may be obtained from Mr. K. Owen, 196, Langley Way, West Wickham, Kent.
25th June: Llanelli Major A.S. Annual Open Show. Details available from Show Secretary, J. Sanders, 28, Sandweild Road, Abererfiog, Bridgend, Glam.
26th June: Skipton and District A.S. Open Show. Schedules available from Show Secretary, Mr. J. E. Taylor, 1, St. Anthony Road, Skipton, Yorks.
27th June: Colchester A.S. Annual Open Show. Details available from Show Secretary, T. B. Millard, 64, Millers Road, Colchester.
28th June: Clitheroe A.S. Annual Open Show. Details available from Show Secretary, Mr. J. F. Spence, 41, Hardwicke Road, Clitheroe, Lancs.
29th June: Swindoll's A.S. Annual Open Show at Swindoll's Primary School, Swindoll's School, Newbury. Details from the show secretary, Mr. J. F. Spence, 41, Hardwicke Road, Clitheroe, Lancs.
30th June: A.S. Annual Open Show at the Guildhall, Cambridge.
31st June: Salisbury and District A.S. Annual Open Show at the County Hall, Salisbury.

27th-28th June: Bristol: Tropical Fish Club. Further details available shortly.

7th July: Chelmsford & District A.S. Annual Open Show at Ambulance Headquarters Hall, 86, Gloucester Road, Chelmsford.
8th July: Forty A.S. Annual Open Show at the Stanley Hall, South Norwood, London, SE25. Further information may be obtained from the Secretary, Mr. D. H. Crowdy, 24, Spencer Road, South Norwood, London, SE26.

3rd-10th August: Portmouth A.S. Annual Open Show at the Showroom of E. Taylor & Co., 52, High Street, Portmouth. Further information may be obtained from the Secretary, Mr. J. F. Spence, 41, Hardwicke Road, Clitheroe, Lancs.

14th-17th August: Malvern Aquarium and Pool Society Annual Open Show, Bingley Hall, Malvern.

1st August-1st September: Harlow A.S. Annual Open Show at the St. Mary's Church Hall, Bishop's Stortford, Herts.

7th September: High Wycombe A.S.

14th September: Reading and District A.S. First Open Show. Details available from Show Secretary, Mr. J. E. Taylor, 1, St. Anthony Road, Skipton, Yorks.

11th September: Rotherham A.S. First Open Show at the Showroom of E. Taylor & Co., 52, High Street, Portmouth.

18th September: Warrington A.S. First Open Show.

19th September: Hounslow and District A.S. Annual Open Show at the Youth Centre, Cecil Road, Hounslow.

25th September: Reigate and Reithill A.S. Annual Open Show at the Town Hall, Reigate. Further information may be obtained from the Secretary, Mr. T. Stamp, 10, Buffin Drive, Reigate.

26th September: Amersham and District A.S. Annual Open Show at the Town Hall, Amersham.

27th September: Newport A.S. Sixth Annual Open Show at the Dunton Junior High School, Show Hill, Newport. Further details may be obtained from the show secretary, Mr. J. E. Taylor, 1, St. Anthony Road, Skipton, Yorks.

30th September: Bucknell and Buckwell A.S. Annual Open Show.
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This competition is open to all keepers of tropical fish, professional and non-professional alike, and there will be a separate section for Marine Aquaria.

The organisers will provide 24" x 12" x 12" stainless steel aquarium with hood, lights and heater/thermostat.

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* refreshments will be available during the setting-up period and throughout the duration of the exhibition. * there is seating, in the hall, for 500 people. * there is adequate parking space within 50 yards of the exhibition hall, and the main line railway station, and the bus station, are within easy walking distance.


RULES AND REGULATIONS
2. Judges decision will be final.
3. Entries accepted up to May 10th at 25/-. late entries accepted up to June 1st at 35/- and no entries will be accepted after June 1st.
4. Any competitor may enter any number of entries and win any number of prizes.
5. No aquarium will be dismantled under any circumstances before 5 p.m. on the final day.
6. All aquarium water will be removed by the management.
7. Any person employed, related, or in any way connected with the organisers are exempt from entering the competition.
8. Whilst the utmost care will be taken, the organisers cannot be held responsible for loss of or damage to any property or livestock deposited in the exhibition hall prior to and throughout the duration of the exhibition.

ENTRY FORM

To: Keith Barraclough, 568 Great Horton Road, Bradford, 7, Yorks.
The First National Aquarium Exhibition, Bradford, June 1968.

I, __________________________ (name)
Address ____________________________

wish to submit __________ entries (25/- per entry up to May 10th, late entries 35/-), for the National Furnished Aquarium Exhibition, Freshwater/Marine section (delete where not applicable).

Please find enclosed P.O./Cheque to value £ __________ P.O. No. __________ Cheque No. __________

This entry form confirms the acceptance of the rules and regulations laid down above.

Entrant's signature __________________________ Date __________

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<td>6d. each</td>
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<tr>
<td>Vallisneria contortions</td>
<td>1½ each</td>
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<tr>
<td>Sagittaria natans</td>
<td>6d. each</td>
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<tr>
<td>Ambulia</td>
<td>10d. each</td>
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<tr>
<td>Bacopa</td>
<td>6d. each</td>
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<tr>
<td>Hygrophila polysperma</td>
<td>6d. each</td>
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<tr>
<td>Ludwigia</td>
<td>8d. each</td>
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<tr>
<td>Water Wistaria</td>
<td>1½ each</td>
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<tr>
<td>Indian Ferns</td>
<td>1½ each</td>
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<tr>
<td>Riccia (floating)</td>
<td>1/6 per portion</td>
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<td>Cabomba (green)</td>
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<td>Cabomba</td>
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<td>Ciliaa (Narrow Leaf)... 3/-...</td>
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<td>Hygrophila</td>
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<td>Vallis (Straight)</td>
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<td>Griffithi... 3/-...</td>
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<td>Vallis (Twisted)</td>
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<td>Navillii... 3/-...</td>
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