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For Complete Tropical and Coldwater
Aquaria also Tropical Marine
100 Varieties of fish usually in stock on view
in 76 polished stainless steel aquariums

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T.F.H. BOOKLETS
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The GRO-WEL 5-way Convertible Trap
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March, 1965
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100 Varieties of Tropical Fish
PLUS
Coldwater Fish, Pond Fish and Plants, Water Lilies, Marginals etc. Daphnia, Tubifex and Dried Foods. Turtles, Lizards, Bush Babies, Parakeets, Mynahs and Budgerigars.

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II STATION ROAD · MARLOW · BUCKS

March, 1965
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FROM

THE

'Es-Es' RANGE

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March, 1965
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In Aquarium or Pond.
Easily measured bite size pellets.
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THE ORIGINAL
PREMIER BIOLOGICAL FILTER

It is unique. It is reliable. It is unseen
It is nature's own method of filtration
It is permanent. It needs no attention

They are saying . . . .

1. BETTER CIRCULATION. The Premier Biological Filter collects water from the bottom and recirculates it, thus preventing cold spots—in tanks fitted with this filter fry will even feed at gravel level.

2. HEAT ECONOMY— the action of the Premier Biological Filter gives a continuous circulation of heat and thus provides the desired temperature evenly throughout the aquarium, saving of current costs is noticeable.

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4. WATER CLARITY — tanks are kept suspension free, always crystal clear water. The Premier Biological Filter continually filters and purifies the water.

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6. NEATNESS. The Premier Biological Filter is fitted underneath the gravel, only the air lift is visible. Can be worked by even the smallest of vibration aerators. Once installed can be left for years—will not clog up. Suitable for both cold water and tropical aquariums.

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Telephone: Victoria 5179
### Tropical Fish

#### Interesting fish this month
- South American Livebearers
  - Hybrid Blue Mollys
  - Florida Blue Platers
  - Salt & Pepper Platers
  - Pearl Variants
  - Marigold Hi-Fi Placy
  - Starlight 
  - Trudy Superfish

#### Tropical Fish List Mar/April

<table>
<thead>
<tr>
<th>Fishes</th>
<th>Stock Arriving Weekly</th>
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<tbody>
<tr>
<td><strong>LIVEBEARERS</strong></td>
<td></td>
</tr>
<tr>
<td>Guppies</td>
<td></td>
</tr>
<tr>
<td>Fancy</td>
<td>1:6:6 pair</td>
</tr>
<tr>
<td>Assorted</td>
<td>1:6:6 pair</td>
</tr>
<tr>
<td>Lace Guppies</td>
<td>1:6:6 pair</td>
</tr>
<tr>
<td>Swordtails</td>
<td>2:6:6 each</td>
</tr>
<tr>
<td>Red Standard</td>
<td>2:6:6</td>
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<tr>
<td>Red Large</td>
<td>2:6:6</td>
</tr>
<tr>
<td>Green</td>
<td>2:6:6</td>
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<tr>
<td>Red Wagtail</td>
<td>2:6:6</td>
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<tr>
<td>Tuxedo</td>
<td>2:6:6</td>
</tr>
<tr>
<td>Red Eye Red</td>
<td>2:6:6</td>
</tr>
<tr>
<td>Golden</td>
<td>2:6:6</td>
</tr>
<tr>
<td>Simpson Red</td>
<td>2:6:6 pair</td>
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<tr>
<td><strong>TROPICAL FISH</strong></td>
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</tr>
<tr>
<td>Black Neon</td>
<td>2:6-6 each</td>
</tr>
<tr>
<td>Bloodfin</td>
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<tr>
<td>Pheasant-Tail</td>
<td>2:6-6</td>
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<tr>
<td>Marble Koi</td>
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<tr>
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<td>2:6-6</td>
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<tr>
<td>Black</td>
<td>2:6-6</td>
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<tr>
<td>Comet Tail</td>
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<tr>
<td>Florida Blue</td>
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<tr>
<td>Florida Red</td>
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<tr>
<td>Golden</td>
<td>2:6-6</td>
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<tr>
<td>Gold</td>
<td></td>
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<tr>
<td>Golden</td>
<td></td>
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<tr>
<td><strong>LABYRINTHS</strong></td>
<td></td>
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<tr>
<td>Siamese Fighter (Male)</td>
<td>2:6-6</td>
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<tr>
<td>Siamese Fighter (Female)</td>
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<tr>
<td><strong>GOONDIJ</strong></td>
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<tr>
<td>Thick Lip</td>
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<tr>
<td>Dwarf</td>
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<tr>
<td>Three Spot</td>
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<tr>
<td>Opaline</td>
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<tr>
<td>Pearl (Leel)</td>
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<td>Kissing</td>
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<td>Rainbow Fish</td>
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<tr>
<td>Moonlight (Guppy)</td>
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<tr>
<td><strong>TETRAS</strong></td>
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<tr>
<td>Glowlight</td>
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<tr>
<td>Neon</td>
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<tr>
<td>Sunshine</td>
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<tr>
<td>Red Rainbow</td>
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<tr>
<td>Red</td>
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<tr>
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<tr>
<td>Serpent</td>
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<tr>
<td>Silver</td>
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<tr>
<td>Gold</td>
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<tr>
<td>Silver</td>
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<tr>
<td><strong>PANCHEX GROUP</strong></td>
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</tr>
<tr>
<td>Panchax</td>
<td>2:6:6 each</td>
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<tr>
<td>Sora</td>
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<tr>
<td>Linea</td>
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<tr>
<td>Cherry Orange</td>
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<tr>
<td>Throat</td>
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<tr>
<td>Playfair</td>
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<tr>
<td><strong>APNEANDOLIN</strong></td>
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<tr>
<td>Veilfin</td>
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<tr>
<td>Filamentous</td>
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<tr>
<td>Caledon</td>
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<tr>
<td><strong>RASBORAS</strong></td>
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<tr>
<td>Harlequin</td>
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<tr>
<td>Firetail Rasbora</td>
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<tr>
<td>Scarlet Rasbora</td>
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<tr>
<td>Rasbora Kioi</td>
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<tr>
<td>Rasbora Ornata</td>
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<tr>
<td><strong>CICHLIDS</strong></td>
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<td>Red</td>
<td>2:6-6</td>
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<tr>
<td>Red Tail</td>
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<tr>
<td><strong>DANIO</strong></td>
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<tr>
<td>Danio Rerio</td>
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<tr>
<td><strong>DWARF CICHLID</strong></td>
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<tr>
<td><strong>VARIous OTHERS</strong></td>
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<tr>
<td>Malayan Angelfish</td>
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<tr>
<td>Bumblebees</td>
<td>2:6-6</td>
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<tr>
<td>Silver Fish</td>
<td>2:6-6</td>
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<tr>
<td>American Flag</td>
<td>2:6-6</td>
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<tr>
<td>Leaf Fish</td>
<td>2:6-6</td>
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<tr>
<td>Madagascar Rainbowfish</td>
<td>2:6-6</td>
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<tr>
<td>Australian Rainbow</td>
<td>2:6-6</td>
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<tr>
<td>Glass Fish</td>
<td>2:6-6</td>
</tr>
<tr>
<td>White Cloud Mountain</td>
<td>2:6-6</td>
</tr>
<tr>
<td><strong>THE AQUARIIST</strong></td>
<td></td>
</tr>
<tr>
<td>215 Great Horton Road - Bradford 7 - Yorkshire</td>
<td></td>
</tr>
<tr>
<td>Telephone: Bradford 75372</td>
<td></td>
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<tr>
<td>(TRADE SUPPLIED)</td>
<td></td>
</tr>
</tbody>
</table>
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1. 50 Plants for your pond £1
2. 30 Plants for your pond 10/-
3. 50 Plants for your aquarium £1
4. 30 Plants for your aquarium 10/-

SPECIAL OFFER
LARGE WHITE WITH YELLOW CENTRES FLOWERING WATERLILIES
5-year-old plants £2

BREEDING PAIRS OF GOLDFISH 10"-12"
BREEDING PAIRS OF GOLDFISH 8"-9"
BREEDING PAIRS OF GOLDFISH 6"-7"
BREEDING PAIRS OF SHUBUNKINS 10"-12"
BREEDING PAIRS OF SHUBUNKINS 8"-9"
BREEDING PAIRS OF SHUBUNKINS 6"-7"
BREEDING PAIRS OF NYMPHS 6"-7"
BREEDING PAIRS OF NYMPHS 4"-5"
BREEDING PAIRS OF CALICO COMETS 8"-9"
BREEDING PAIRS OF CALICO COMETS 6"-7"
BREEDING PAIRS OF GOLDEN ORFE

2'-3' BITTERLING, ORFE, BASS, GREEN TENCH, NYMPHS, RUDD 4/6 each. 3'-4' GOLDFISH AND SHUBUNKINS 3/6 each

All above fish are pond bred.
Rail and Packing – 15/-

FLEXIBLE PLASTIC GARDEN POOLS
4" x 3" x 9"-15" deep £3 19 6
6" x 4" x 9"-18" deep £5 18 0
8" x 5" x 9"-21" deep £7 19 0
10" x 6" x 9"-24" deep £10 10 0

Garden Pools and Cascades
OVER 20 DIFFERENT SIZES
(SEND FOR LIST)

STUART PUMPS FOR YOUR WATER FALLS No. 12 £12 7 6 Postage 5/-
FOOT VALVE AND STRAINER WITH CONNECTOR £1 17 6
ADJUSTABLE GARDEN JETS 10/6.
STOKES FOUNTAINS FOR YOUR PONDS £7 19 6 each
Send for catalogue S. A. E.
The New Otter Submersible Pump Complete with Either Fountain or Waterfall Kit £8 8 0 post paid

QUEENSBOROUGH FISHERIES
See next page for address particulars, etc.

March, 1965
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**OFFER No. 1**
- 2 Victoria... 1.5
- 1 Aquatic New Zealand 1.5
- 1 Nymphaea... 1.5
- 1 Nymphaea utiliss... 1.5
- 1 Cryptocoryne Haematodes... 1.5
- 1 Micro Sagittaria... 1.5

*Years for 25/-.*

**OFFER No. 2**
- 50 Assorted Tropical Plants including:... 10/-
- Dwarf Lily, Apogonum Cryptocoryne, Wisteria.
*Years for 20/-.*

**OFFER No. 3**
- 30 Assorted Tropical Plants... 10/-

**OFFER No. 4**
- 30 Assorted Coldwater Plants... 10/-

**EXTRA SPECIAL**
- Water Lettuce, very beautiful plants... 2/6

**SPECIAL SERVICE**
*Live Daphnia by post... 2/- including postage*

## BOW-FRONTED AQUARIUMS
- 36ins. x 12ins. x 15ins. bow-fronted aquarium with w吸引了。$24.95
- 48ins. x 12ins. x 15ins. - $29.95

*Available in peche bronze, black & gold, and cream*

## WITH PLAIN STAND
- Inches: 48 x 10 x 15 - $22.15
- 24 x 12 x 15 - $12.15

*Complete with stand and hood (15ins. to centre of bow)*

### STANDS

<table>
<thead>
<tr>
<th>Description</th>
<th>Dimensions</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>Thermostatic Heaters</td>
<td>18 x 10 x 36</td>
<td>37.5</td>
</tr>
<tr>
<td>Heaters, 100w, and 150w</td>
<td>24 x 12 x 36</td>
<td>37.5</td>
</tr>
<tr>
<td>Pre-constructed, Thermostatic Heaters 12 x 18 and 36 ins.</td>
<td>36 x 12 x 36</td>
<td>37.5</td>
</tr>
</tbody>
</table>

## REMEDIES, etc.

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatonic</td>
<td>3/-</td>
</tr>
<tr>
<td>Broadleaf White Spot</td>
<td>1/-</td>
</tr>
<tr>
<td>Copper</td>
<td>2/-</td>
</tr>
<tr>
<td>Diesel</td>
<td>2/-</td>
</tr>
<tr>
<td>Vino Spots</td>
<td>2/-</td>
</tr>
<tr>
<td>Browm Fertilizing</td>
<td>1/8</td>
</tr>
<tr>
<td>Sea Salt</td>
<td>1/-</td>
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*Terracotta all 4x6 each*

*Please add 1/6 extra postage on orders over 15/-.*

## THERMOSTATS

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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<tbody>
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<td>Custom External</td>
<td>25/-</td>
</tr>
<tr>
<td>Custom New External</td>
<td>25/-</td>
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*Years for 25/-.*

## FILTERS

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## PLANTS

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<tr>
<td>“Aquarium” Tropical Fish Food</td>
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## BOW-FRONTED AQUARIUMS

36ins. x 12ins. x 15ins. bow-fronted aquarium with w吸引了。$24.95

48ins. x 12ins. x 15ins. - $29.95

*Available in peche bronze, black & gold, and cream*

## HEATERS

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## FULLY-GLAZED AQUARIUMS

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**LIVE FOODS**

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**BOOKS**

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<tr>
<td>Encyclopedia of Tropical Fish</td>
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<td>Exotic Tropical Fishes</td>
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**FULLY-GLAZED AQUARIUMS**

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**CARRIAGE ENTRATA**

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What Sort of Filter?

If the number of different makes of aquarium filters on the market is anything to go by then a very wide use of filtration as an aid to aquarium-keeping is being made today. Although filters are not essential aquarium accessories, we have always maintained that where artificial aeration is being employed the filter offers the best possible means of using the air supply. Voices of the experienced are in fact seldom raised against the principle of aquarium filtration, but these same voices are quite often heard speaking in favour of or emphatically against some particular kind of filter or another. What is the beginner to think when he hears conflicting opinions?

The conflicts here, such as inside filters being better than outside ones or vice versa, or undergravel filters being the best of all or being positively harmful, arise from aquarists' attempts to generalise from their own individual experiences, and these they may or may not have analysed correctly. Discussion of filters often bog down because what is being compared cannot be comparable. There is no standard aquarium: some are of large capacity, some are small; some are heavily planted, some are unplanted; fishes that may be kept represent a wide range of types, as do, indeed, the water plants; foods used differ from one aquarist's tank to another. Yet all these things, among quite a few other factors, could influence the results obtained with any filter.

Aquarists are not always even certain of what they mean by 'filtration', and confuse a filter's capacity to remove non-dissolved, suspended particles from water (which is really all that filtration can be held to imply) and its possible additional use to limit the accumulation of dissolved substances in water (which is probably 'absorption', taking place only when some agent such as carbon is included in the filter). It is, of course, suspended matter that causes opacity or cloudiness of water, and therefore it is filtration that is usually the aquarist's primary concern. More care to preserve this distinction would help in discussions; we should be quite sure whether filter medium and absorption medium or either of these alone is involved in any filter's operation when results are assessed.
Natural and Planned Breeding

by A. JENNO

harm to the structure of Nature's own fixed pure strain. For this reason, because cultivated fishes are really freaks and abnormal fishes, there is always the certainty present that if the cultivated fishes are allowed to breed indiscriminately they will revert back to the wild pattern of the pure strain. It is therefore essential to practice careful selective breeding to keep the strain in its altered state and to alter it even more if required.

With natural fishes, however, indiscriminate breeding can be practised, because there can be no reversion to the wild form as the breeding stock are already reproductions of this wild form. In fact indiscriminate breeding is essential to maintain the strain at its best, as developed in the wild. While a natural strain may be improved a little in captivity in such characteristics as size, intensity of colour, shape of finnage, these are not alterations to the strain, but only improvements to the individual fishes caused by a better standard of living and the removal of many of the natural hazards, such as sickness and shortage of food which the fishes may meet with in Nature.

It follows then that when breeding a natural strain, the selection of breeding stock is considerably easier than for a cultivated strain because we are not trying to alter Nature's pattern. From time to time in a natural strain freak fishes will appear which do differ from normal; for instance, tiger barbs which have part of one of the black bars missing. These fishes must not be used as breeding stock otherwise the fault will probably be reproduced in their young or in a later generation. This is, of course, the origin of the cultivated strains. Aquarists have deliberately developed freaks of Nature by using them as breeding stock and closely inbreeding the resulting youngsters to concentrate and finally to fix the freak characteristic.

From this then it can be seen that to breed a natural strain and keep it at its best, the effect of these occasional freaks must be kept to a minimum. It has been stated that close inbreeding will concentrate the effect of a freak characteristic, so it is essential to avoid close inbreeding at all costs.

Assuming an aquarist is seriously going to breed a natural strain he must start off by obtaining breeding stock which is unrelated or, at the very least, not closely related. Also he should obtain enough fish to make up as many breeding pairs as he can manage, so that by allowing his breeding stock to pair up indiscriminately he can ensure that each batch of youngsters is not closely related to the other batches. In this way his strain will always be widely unrelated and consistent inbreeding will not occur. If it is difficult to obtain unrelated breeding stock, as may be the case with some of the rarer fishes when starting to breed, then the aquarist may be forced to start off his strain by close inbreeding. As long as the initial breeding pair are true representatives of the natural strain a little close inbreeding can be tolerated if circumstances make this essential, but unless the strain is to deteriorate, fresh unrelated blood must be brought in at least every third generation. Beside amplifying freak characteristics in the strain, close inbreeding will also introduce defects such as lack of vitality and delicate health if carried on for several generations. This is why the cultivated strains are often
more demanding in their living conditions and food requirements than the original wild fishes.

Indiscriminate breeding of a natural strain is made easier in many cases by the fact that many species will spawn as a shoal. This is termed "flock-breeding." The danios and most of the barbs are good examples of this. Several can be placed together and will freely interbreed. Indeed, many species prefer this method. Wherever possible, flock-breeding should be practised, as this is one way of avoiding close inbreeding and thus maintaining the quality of the natural strains.

Cultivated Strains

The propagation of a cultivated strain of fish is far more challenging to the serious breeder and demands a lot more concentration and experience. In effect, the aquarist is defying Nature and is attempting to bring about a permanent alteration to the natural form of a particular species of fish. Nature considers these fishes to be abnormal and any mistakes by the breeder in his selection of breeding stock will result in the strain reverting to the wild form. If breeding stock is used which has partly reverted then the rate of reverting back will be accelerated. Also, while the breeder is producing in his strain those altered characteristics which he considers desirable, other altered characteristics will probably turn up, many of which may be undesirable and detrimental to the strain. Even more severe selective breeding will then be necessary to maintain the strain without these undesirable alterations and still, of course, without the strain reverting to the wild form.

The basic method of constructing a cultivated strain is the use of continuous close inbreeding. By the laws of probability this concentrates the original freak characteristic which the cultivated strain starts and allows it to be passed on by careful selection of breeding stock into a final strain. A strain which has been treated in this way will suffer because while the desirable alterations are being produced, undesirable ones will come with them, however the breeder may be, and thus we find that, for instance, fancy guppies and many strains of fancy goldfish and inactive and cannot stand cold weather as well as a natural strain.

It may be found that in the first generation the freak characteristic is not to be seen on any of the fish. This does not mean that it has been lost, only that it has been covered up by more dominant characteristics which still exist in the strain. The way to uncover the freak characteristic would be to mate the original freak fish with all the fish of the opposite sex from the first generation, when the freak condition should appear in the second generation, in a reasonable proportion. If the second generation freak fish are then crossed back to the original freak fish (actually their grandparents) then the freak characteristic should be reasonably fixed in the strain.

Having obtained initial breeding stock in this way the breeder can now proceed to concentrate on developing the freak condition into a fixed, altered characteristic by closely inbreeding his fish and using only those fish which carry the characteristic. He must, of course, also concentrate on removing any undesirable characteristics which occur through constant inbreeding. Small size of mature fish is a frequent example of this.

Development of the new strain to a pure state may take many generations of careful and exacting work, but finally the aquarist should reach a point where all of the fish bred

Swordtails, like the fancy guppy also pictured on this page, are an example of a species that has developed many separate varieties in aquaria.

Let us suppose that an aquarist has a good natural strain of fish, and in one of his batches of young he finds a freak fish which is different in one of its characteristics from the normal form of the species, and the aquarist then decides to attempt to establish a strain of fish which will eventually breed pure in this altered form. Obviously, the first move will be to give the freak fish the best food and living quarters available and to generally pay it the greatest attention to bring it to sexual maturity in as good a condition as possible. This fish, depending on its sex, is then crossed back either to its mother or father. If this is not possible then it can be crossed with a sister or brother, but unless the sister or brother used exhibits the same freak characteristic this method is not so reliable. All the young from the first back-crossing are then kept and reared to sexual maturity in the best conditions.

March, 1965

Continued at foot of next page

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Prochilodus insignis

Prochilodus insignis (reduced in size)

This striking and lively member of the family Anostomidae comes from Guiana and the Amazon Basin, and under favourable conditions will attain a length of about 6 in. in captivity, about 14 in. in the wild. Like most energetic fishes, it has a hearty appetite, and though in Nature it lives largely on insects and their larvae, small crustaceans, and various types of algae—it can deal with these admirably by virtue of its distensible, thick-lipped mouth, which can be converted into a circular sucking disc—in the aquarium it will thrive on any of the regular dried and live foods and suitable substitutes for its preferred green food in the form of scalded or bruised lettuce, or cooked tender cabbage or spinach.

The fish frequents all levels of the water, which to suit it should be soft and slightly acid, and soon becomes quite tame after an initial spell of shyness. It has a natural aptitude for jumping, and in this connection the importance of keeping the aquarium properly covered cannot be overstressed. It is hardly enough to withstand a slow drop in the temperature to 66°F (20°C), but 75°F (24°C) with a range of about 5°F either way is to be preferred.

In immature (small) fish the general colour is bluish green on the back lightening to silvery overlaid with blue or green on the sides. These are adorned posteriorly with a number of blue-black dots and/or streaky markings arranged in horizontal rows. The underparts are flushed with violet to pink. The large caudal fin is widely forked and longitudinally striped with dark blue to black on an ivory ground. The dorsal, anal and tiny adipose fins are yellowish to green with some blue to black markings; the pectoral and ventral fins are reddish. In well grown fish the dark adornments on the sides tend to disappear and leave the body an overall silvery hue, except the belly which retains its pinkish appearance.

P. insignis is peaceful, at least in its smaller sizes, and a shoaling species that makes a singularly attractive show-piece in a community tank. Although numerous importations have been made into Europe and America since it was first introduced to aquarists in Germany more than 50 years ago, it has not bred in captivity and, furthermore, it is not known what secondary sexual characteristics, if any, exist. Owing to the distinctive stripes on the caudal fin, the species is sometimes referred to as the flag-tail prochilodus.

Natural and Planned Breeding

(continued from preceding page)

from the strain show the altered characteristic. At this point the strain can be tested for purity. This is done by flock-breeding and if this proves successful the strain can be considered pure.

There are many complications to overcome in some particular cases, but others may be exceptionally easy. It all depends on the nature of the fresh characteristic which is to be developed. Some characteristics may be semi-linked, i.e. the heredity factor for these will only be carried by the male or the female fish, never by both. The characteristic may become so closely entangled with some other undesirable characteristic, because of the particular inbreeding methods used, that it becomes impossible or very difficult to continue the strain. All these problems are a challenge to the breeder and this is what makes the cultivation of a new strain so absorbing.
Power-Cut Protection

by M. J. STAINES

Do you dream of waking up in the morning to find a power-cut in operation with disastrous results to your fish? We have all suffered these nightmares, but I am glad to report that they can be forgotten by using the device described below.

The 'sensing' element is designed on the well-known 'thermostat' principle. A lamp bulb connected to the mains will heat which holds the contacts of a thermostat open. Should there be a power-cut, or the lamp fail, the contacts will close, and connect a battery to an electric bell which continues ringing until switched off by the awakened aquarist.

Construction

The arrangement of the parts and the electrical wiring is made clear by the drawing. Construction is as follows.

Take the plastic carton and cut round the top, leaving about ¾ in. of the neck intact, and cut a hole in the bottom. Bend a florin for the lamp-holder. If the neck is too small, heat it quickly over a gas ring and push the thermostat mended with soapy water into the hole to enlarge it. The air-hole at top and bottom should now be made with a headed apple-corer or similar tubular tool. A pen-knife can be used to cut round the three sides of the flap, the fourth side being left as a hinge. Attach sufficient flex to the lamp-holder to reach from your bedside to a convenient mains supply, which can be a light socket or power-point, but remember it must be switched on all night. Now screw the plastic carton, bell and battery shelf to the prepared board and assemble complete as shown in the drawing.

The wiring is as follows: red thermostat wire to right-hand bell terminal and the black one to the switch. The other side of the switch carries a short wire to the crocodile clip, and a similar wire and clip is attached to the remaining bell terminal.

The unit is designed to hang on a wall but may be arranged differently provided that the plastic carton is fitted upright. If enclosed in a case, holes should be made in the top and bottom to allow air to circulate, or the operation will be delayed.

Put it into operation in this way. With the bell switch in the 'off' position, plug into the mains and allow time for the thermostat to warm up. Now put the bell switch to 'on', the bell will now remain silent until the power is cut. Test initially by switching the mains off. The bell should ring 1 to 3 minutes later.

Emergency Action

In the event of a power-cut, first of all insulate the tanks with cushions (especially foam rubber ones from armchairs), eiderdowns, pillows, blankets etc. Cover the tanks completely, hoods and all, leaving no exposed glass.

A tank 2 ft. by 1 ft. by 1 ft. well covered in this way will lose heat in a cold room at a rate of about 3°F per hour if left severely alone. Do not be tempted to read the thermometers for at least 2-3 hours. Concentrate on getting the room as warm as possible. If the room temperature can be kept at 65°F (18.3°C) the tanks may be uncovered. Unless a tank is very severely overcrowded there should be enough oxygen in the water to last at least 5 or 6 hours without ventilation of any sort.

March, 1965

<table>
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<td>2</td>
<td>Crocodile clips</td>
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<td>3</td>
<td>Flashlamp battery (4½ volt)</td>
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<tr>
<td>4</td>
<td>Electric door bell</td>
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<tr>
<td>5</td>
<td>Submersible thermostat</td>
</tr>
<tr>
<td>6</td>
<td>Lamp-holder</td>
</tr>
<tr>
<td>7</td>
<td>Bulb (5 watt) mains voltage</td>
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<tr>
<td>8</td>
<td>Large washing-up liquid plastic carton</td>
</tr>
<tr>
<td>9</td>
<td>Board (¾ in. thick) for mounting</td>
</tr>
<tr>
<td>10</td>
<td>Power plug or lamp adaptor (for bedroom)</td>
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<tr>
<td>11</td>
<td>Numbene length of 5 amp. flex</td>
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Total cost approximately £1.50. Most of these parts may be obtained at a good electrical store.
ABOUT THE POND THIS MONTH

Planting Time will soon be Here!

by A. BOARDER

Photographs by W. J. HOWES

THE pondkeeper will find plenty to do during March. Before the end of the month some of the water lilies will have started to send out fresh leaves and perhaps flower buds. Although April may be the best time to plant new lilies it is possible to divide suitable subjects from the last week in March. It must be realised that new plants may have to be out of the water for some time and so it is not wise to get new ones just yet. However, if there are some plants in the pond which need dividing, it is quite safe to do it now, and the best shoots can be seen easily.

Any water lily which has grown fairly well needs dividing after 3 or 4 years. This is especially so in a small pond where it is possible for a plant to get so far out of hand that it takes up too much space. When this happens much of the beauty of the lily is lost. Whilst the lily leaves lie flat on the top of the water and there is still plenty of open space there, all is well. Once the leaves become so abundant that they just cannot find a spot in which to lie, they will grow up into the air and look anything but attractive. Also the whole surface of the pond may be so covered that the fishes cannot be seen nor get to the top of the water if they want to.

If the water lilies were planted in separate containers it is easy to drag them out of the pond for division. It will be found that several thick root-stocks will have formed. Leaf and flower shoots will already be showing. Take great care of these as they are easily broken. It may not matter much if one or two of the leaves are broken but be careful that the flower shoots are not damaged. Some young shoots may be seen at the sides of the root system. These are the ones to retain and take off for planting in another container. If some of the old root-stock appears to be very thick and dull in colour, it can be cut out and disposed of. Often one can see that there are plenty of roots coming from the top of the root-stock whereas lower down there may be no roots and no shoots are likely to come from that part. This can be cut out.

If any fresh plants are wanted, think well before ordering. The main fault with many pond keepers is that they will not realise that most water lilies grow at a fast rate. There is always plenty of water for them and provided that there are some fishes in the pond, there is usually nutrient in the form of fish droppings for them to feed on. A small pond needs only one water lily. A medium growing plant can cover the whole surface of a pond 8 feet by 8 feet in 3 or 4 years. There are so many good types to be purchased that one need only give the dealer the colours required and the depth of the pond so that he will know which are the best ones to provide.

There are lilies for the very small pool which will grow in a foot depth of water. There are many others for ponds up to 2 feet 6 inches deep. Few water lilies need a greater depth than this. The lilies will be sent out usually
In early April, and it is well to get suitable containers ready for them. It is possible to buy plastic planting dishes which will be admirable and last a long time. It is possible to use large flower pots and if this is done it is well to set the pots in a large heap of concrete so that there is a good base to the pot to stop it from turning over in the wind. Much has been written about the need for some good compost or a piece of old turf, in which to plant the lily. This is all very well if the growth of the lily is all that is needed in the pond. There is, however, a very important point for the lilies. The roots should stray over the base of the pond and use up much of the waste material in the pond. They are doing a very good scavenging job and will help to keep the water pure. If too much nourishing matter is given them they will not need to search for and utilise the waste matter.

For the small pool I suggest one of the following: *Nymphaea ledebourii*, *N. odorata alba*, *N. lotus*, *N. nymphaea*, *N. caerulea*, *N. auricula*, *N. aquatica*. For the deeper pond there are: *N. esculenta*, *N. lutea*, *N. inermis*, *N. glauca*, *N. maritima*, *N. nigricans*, *N. sylvestris*, *N. racemosa*, *N. tenuis*, *N. hybridum*, *N. pygmaea alba*, and *N. pygmaea helvola*, *N. helvola*, *N. helvola.* The lilies *N. pygmaea alba* and *N. pygmaea helvola* can be set in a pool no deeper than a foot or less. It is wise to plant any lily in a very shallow pool.

When planting any fresh lily it is essential that the pot is not placed too deeply in the water. If the pond is 2 feet deep, it is better to raise the pot with bricks or other material so that the head of the root-stock is not too close to the surface. Once the leaves start to reach out on the surface the pot can be gradually lowered to its correct position in the pond.

There are many other plants suitable for the garden but the same point must be borne in mind. They grow ramponically and can soon take over too much of the pond. These types of plants are not oxygenators.

Some other plants which can be very attractive though, and a judicious choice of the beauty of a pond considerably. Some good ones are: *Butomus umbellatus*, the flowering rush; *Acorus*, the water ligule; *Pontederia cordata*, the pickerel weed; *Myriophyllum*, *Myriophyllum alpinum*, *Myriophyllum alpinum* alba flori planko, a good double white; *Festuca rubra*.

Rooting or under-water plants can be set in the sides of the pond. The lily like the previous mentioned ones can be weighted and lowered into the pond where they root and grow by themselves. Some of the water plants grow very vigorously in some ponds and in others they appear to fail. It is not difficult to determine which do the best in your pond. One point I must make here and that is the fact that it is quite unnecessary to have many different species of water plants in the pond. It is probable that in the average pond, the use of one oxygenating plant will be sufficient. One of the best is *Lagartophyllum major*, which can spread rapidly with long strong shoots over most of the pond provided that there is some decaying matter at the bottom for the plant's food. Another very good one is *Egeria densa*. This can also spread well and even a small piece can soon make a good coverage if in a suitable pond. *Ceratophyllum demersum* or hornwort is another good plant which can soon spread well. It has no proper roots but appears to attract mud etc. to its stems, and soon throws out many shoots and makes an ideal plant in which fishes love to spawn. *Myriophyllum*, or water milfoil, is a pretty plant but I do not think that it is quite robust enough for the garden pond. It is better used in a tank.

There are some other oxygenating plants, but I have found that the use of more than two kinds in the average pond is not to be recommended. It is usually found that one plant will take precedence over the others and, after all, there is little use in having several species of oxygenators in the pond as they may not be seen very much since the lily leaves cover most of the surface.

Some covering plants can be used if the water becomes too green through the presence of algae. This is likely to form in the water in the spring, as there will not be enough cover from the water plants to cut out the sunshine. It is then that some cover can be provided. I find that the ordinary duckweed, *Lemna*, is ideal for this purpose. It is a good under-water oxygenating plant for the pond. Continued on page 216.
The home layout described in this article is designed to accommodate two 24 in. by 12 in. by 12 in. aquaria with provision for a 24 in. by 19 in. by 12 in. breeding tank if required. The outer case, which is tilted forward for feeding, can be completely removed for cleaning and other purposes.

The advantages of the layout are fourfold:

1. The fixture can be decorated to match the living room and can therefore be aesthetically satisfying.
2. All components of the hobby are contained in a single unit (including breeding tank, accessories, brine shrimp hatcher).
3. All electrical wiring, switches and thermostats are concealed and therefore out of the reach of children and domestic animals.
4. It is more economical than providing manufactured stands and hoods.

As only simple joints are used in the construction the fixture can be made by any handyman provided reasonable care is taken in marking out and in squaring each frame. The materials used should be the best available and free from knots, shakes and other defects.

Beech or similar hardwood should be used for the stand uprights and a hard softwood such as parana pine for all other pieces. All timber must be straight and any warped or unseasoned timber should be returned to the supplier. As the size of the outer case is determined by the dimensions of the stands, the stand must be made first.

The sizes given here may be altered to suit individual requirements but the size between uprights must not be less than the tank length plus ½ in. This is to allow for discrepancies in tank sizes and slight error in cutting the windows in the outer case.

To make the front and back of the stand the uprights and cross-rails should be cut to the exact length; the positions of the screw holes are then marked on the cross rails and drilled (7/32 in. diameter) and finally countersunk to take the head of a 1½ in. No. 10 screw. The position of the cross-rails is next marked on all four uprights, remembering that the bottom rail is kept 1 in. up. The frame should then be laid flat and the rails placed in position. A ¾ in. diameter 'thread hole' is drilled in the upright, concentric with the clearance hole in the cross rail. This is to accommodate the thread of the screw, which would otherwise split the upright or be very difficult to turn. A leading tool manufacturer has introduced a bit, called a 'screw-mate', which will drill thread hole, clearance.
Home Aquarium

J.M. COOPER

hole and countersink in one operation when fitted to a power or hand drill. One screw should be inserted at each joint and the frame checked for squareness (the diagonals should be equal in length) before the second screw is fitted.

The front and back frames are connected by the six short cross-rails in a similar manner, ensuring that the screws do not foul the screws of the front and back frames.

The stand is now complete and should be quite stable.

The outer case comprises three frames which are half-

inner and glued and screwed together with ¾ in. No. 6 screws. The clearance hole this time is 9/64 in. All three frames must be checked for squareness before second screws are inserted.

As the outer case should be a good fit to the stand, on the same principle that the best drawers are those which fit well into the opening, the large frame should be made slightly wider than the breadth of the stand, and planed down until just wider than it.

It is better to nail the hardboard to the side frame before assembly as doing so afterwards may strain the joint between front and side frames. In nailing the hardboard to the frames, ¼ in. deep drive panel pins

Continued at foot of next page

Materials Required

<table>
<thead>
<tr>
<th>Stand</th>
<th>Uprights</th>
<th>Hardwood</th>
<th>Four 5 ft. 4 in. by 2 in. by 1½ in.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cross-rails</td>
<td>Panama pine</td>
<td>Five 2 ft. 3 in. by 1 in. by ½ in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Two 2 ft. 3 in. by 6 in. by ¾ in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>One 2 ft. 3 in. by 4 in. by ¾ in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Four 1 ft. 3 in. by 1½ in. by ½ in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Two 1½ ft. 1 in. by 1½ in. by ½ in.</td>
</tr>
</tbody>
</table>

| Outer Case             | Uprights       | Panama pine | Six 5 ft. 4½ in. by 1½ in. by ½ in. |
|                        | Cross-rails    |            | Two 5 ft. 4½ in. by 1½ in. by ½ in. |
|                        |                | Eight 3 ft. 2½ in. by 1½ in. by ½ in. |
|                        | Hardboard      | One 5 ft. 4½ in. by 1½ in. by ½ in.   |
|                        | Plywood (¾ in.)| One 2 ft. 4½ in. by 1 ft. 2½ in.     |
|                        | Screws         | ½ in. No. 10 |
|                        | Panel pins     | ½ in. Deep drive panel pins |

Two small turn buttons
The Red-eyed Characin

by BORIS FRY

This too seldom seen West African species, a member of the family Characidae, is native to the lower reaches of the river Niger and its tributaries westwards to Lagos and attains about 2½ in. in length. It is commonly called the red-eyed characin because of the fiery glow above the alert-looking black eyes. Another distinctive feature is the scales. These are very large, especially along the middle sides, and glitter like freshly polished silver.

The general colour is brownish on the back, iridescent blue to green on the flanks, and silvery gold with an overtone of pink to red on the belly. A dark horizontal line, accompanied above and below by a yellowish to silvery margin, extends from the gill-covers to the bifurcation of the yellow-lobed caudal fin. The other fins are greenish to yellow; the dorsal with a bold black marking spreading over most of the upper anterior rays; the anal with some whitish streaks. In common with most characins, a small adipose fin is situated on the back near the base of the tail. In mature fish the sexes are easily told apart because the male's body and fins are richer coloured and more streamlined looking than the female's.

The red-eyed characin is a peaceful fish and, owing to its small size, active habits and remarkably attractive appearance, makes a most worthy addition to a community tank. Generally speaking, it is hardly enough to withstand a slow drop in the temperature to about 68°F (20°C), but, not unnaturally for a species whose habitat is close to the equator, a temperature above 72°F (22°C) is recommended.

Carnivorous Fish

It likes a densely planted background, with plenty of swimming space along the front, and water which is clear, soft and slightly acid. As a rule it spends most of its time swimming in the middle levels of the water, but will rise quickly towards the surface for food. It is carnivorous by nature—its mouth is well supplied with teeth—but it will accept any type of dried or small live food, and substitutes for live food such as scraped red meat or shredded shellfish. In the wild it subsists mainly on insects and their larvae.

Although it was first introduced to tropical aquarists more than half a century ago, there are, so far as the writer can ascertain, no records of its having been bred in captivity.

Planting Time

(continued from page 213)

can usually be obtained from a natural pond and if a little is placed on the top of the water it will soon grow and cover a large surface of the pond. Many types of fishes, including goldfish, will eat some of this weed, and so when it is first placed on the water see that there is plenty of other food for the fishes. Once the water warms up in the summer it may be found that the duckweed has spread to such an extent that it has covered most of the surface of the pond. Much of it can be removed by playing a hose from one side of the pond and rolling the mass of duckweed to one side. It can then be raked out and used as a mulch in the garden. There is no need to remove all of it at a time, or you will have the green algae back again.

Remember that a pond requires careful planting to ensure that it remains attractive and does not get overgrown in a short space of time. I know that some of the plants can be removed or pruned back fairly easily, but it is a waste of money and time to purchase many more plants than is necessary. Do be patient and it won’t be long before your pond becomes the envy of visitors and is a source of enjoyment to you and your family.

A Decorative Home Aquarium

(continued from preceding page)

should be used as these do not require to be punched later. The frames must be laid flat for nailing since a frame which has a bend in it during nailing will retain the bent shape.

The side frames should be screwed to the front frame with 1½ in. No. 10 screws.

The ½ in. plywood top is next pinned to all three frames and the whole assembly tried for fitting over the stand.

The hardboard of the front frame is tacked in position, allowing about ½ in. projection at each side. The windows are then accurately marked on the face of the hardboard in the case of glazed tanks, but with unglazed tanks the windows may be marked accurately on the back of the hardboard, i.e. from the inside of the frame. A ½ in. drill is used at each corner of the window and the windows marked accordingly. A keyhole saw may then be used to commence cutting out the windows. The entire cover is then tried in place and the front hardboard pinned into correct position. The surplus at the edges is planed off, and all corners are rounded with glasspaper before papering.

Turn-buttons should be fitted at the top back corner of the outer case to retain the case hard against the stand.

THE AQUARIST
American Terrapins in Aquaria

by V. G. BREEZE

ALTHOUGH Pseudemys scripta elegans comes from the area around Texas, Pseudemys ornata californica from Columbia, their requirements are very similar. Pseudemys scripta elegans has a yellow stripe on each of the non-carapace (upper shell), and the 'ear' is bright yellow. Pseudemys ornata c., however, has an orange 'ear', and markings on the plates of the carapace are more circular. The general colour of both species is dark green.

The general shape of each species is almost identical, but the hind feet of P. scripta c. are more webbed than those of P. ornata c., which is perhaps the stronger of the two.

Temperature

Both species need a temperature of about 76°F (25°C), and about 8 to 10 hours of light (daylight if possible) per day. Very small specimens should have 2 inches of water: a tank up to 18 in. will hold two or three 1½ inch terrapins. The tank should have a slate ramp or rocks situated so that the terrapins can climb out to sun themselves (this is done to speed digestion, and to kill leeches and skin parasites). A half inch of gravel on the bottom is necessary if the tank is made of transparent glass.

The animals should have as much space as possible, but the accompanying table is given as an idea of minimum requirements:

<table>
<thead>
<tr>
<th>Size of terrapin</th>
<th>Number in tank</th>
<th>Size of tank (in.)</th>
<th>Depth of water (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>2</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>1.5</td>
<td>4</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>1.5</td>
<td>8</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>12</td>
<td>4-6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>12</td>
<td>4-6</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>24</td>
<td>6-7</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>larger than 6</td>
<td>4</td>
<td>36</td>
<td>6</td>
</tr>
</tbody>
</table>

Since the terrapins are larger than 4 inches, a heated fibreglass pond is more practical than a glass tank. As fibreglass is rather tedious, polythene can also be used. If polythene is preferred, any seams must be sealed with a rock or slate, as terrapins will bite through seams. For only one or two large animals, a big fibreglass aquarium is probably easier to maintain than a pool. Hard fibreglass is preferable to soft, because it cannot in any way be damaged. If an immersion heater is used, it must be covered with a piece of stainless-steel mesh to prevent the animals burning themselves. A filter may be necessary.

The best foods for small P. scripta c. and P. ornata c. are earthworms, lettuce, finely chopped meat and shrimp. Lettuce is essential, and I have found that small earthworms are favoured. Halibut oil and bone meal should be given periodically (at least once a week). These can be sprinkled over meat. Healthy young guppies may also be eaten. Larger terrapins eat meat greedily.

Terrapins smaller than 3 inches should be fed every day, with lettuce or vegetable matter at least once a week. Larger animals may only eat once or twice a week.

Well-kept terrapins suffer from few diseases, but soft shells and rickets are common. These indicate (i) lack of light, (ii) lack of calcium or (iii) lack of lettuce, and can be cured if discovered early. Algae growth on the shell does not seem to be detrimental. Fungus and bacterial diseases can be cured with methylene blue.

Growth

With good light and food, a terrapin may grow 2 inches per year: under ideal conditions, 3 inches is possible. Rates of growth vary slightly from season to season. P. scripta c. and P. ornata c. are probably the easiest terrapins to raise, but losses are inevitable. This is hardly surprising, considering the way they are handled during transport. Losses usually occur during the first few weeks of captivity. Once the young terrapins are over the 2 inch stage, they rarely look back. At this time, they are very lively. P. ornata c. is especially active; P. scripta c. is rather docile. If picked up, the former kicks with all four feet, and when replaced in the water, swims away rapidly, instinctively diving to the bottom.

When two or more terrapins are kept in one tank, fierce wrestling matches take place during feeding time. The food is snatched by one, who dashes off into a corner, where he proceeds to eat it. Then another comes across, grabs the morsel, and the fight starts. The two twist and turn, all the time seeming to be trying to tear their opponent's eyes out with the front feet. The skin around the face must be very tough, because the powerful strokes of the claws never seem to cause any damage. These fights should not be encouraged, but only should be stopped if one animal is being damaged. It is important to see that the weaker partner does not go unfed.

These two species, indeed all terrapins, make very interesting pets, being well suited to the aquarist who wants something different in his collection.

Price of The Aquarist

It is regretted that because of increasing costs of production and distribution of periodicals the publishers of The Aquarist have to increase the price of the journal to 2s 6d, starting with the April issue. Subscribers will be notified of the new rates when current subscriptions come to an end.
IN the profusion of tributes offered to the memory of a great man earlier this year I saw no mention of the fact that the late Sir Winston Churchill was an aquarist of no small ability. Undoubtedly this is only because in his full and varied life he found time to do so much that was worthy of comment. However, the tanks in the London Zoo Aquarium stand as a permanent memorial to this side of his life, and collectors of The Aquarist will recall that on at least one occasion these pages contained a photograph of the great man at one of the National Aquarium Shows in London and displaying obvious interest. It is thus fitting that we should at least be aware that among the many activities that have lost an able supporter by the death of Sir Winston ranks the hobby of aquarium-keeping.

One of the singular characteristics of this hobby of ours is the number of other pastimes to which it can introduce us, without in any way lessening our enthusiasm for tropical fishkeeping. The aquarist may well branch out into such diverse fields as photography, geology, or philately as a direct result of his being an aquarist. One of the most interesting was the ardent aquarist who recently took up psychology with the intention of discovering why a tank of fish (often to be seen in medical men’s waiting rooms—or so I am told) is always credited with tranquilizing effects at least equal to those of many sedatives. He came to the Freudian conclusion that the fish in the enclosed space were a “womb symbol”—pointing out that water in mythology and dream interpretation has long had a uterine significance. Thus, the aquarium satisfies, or at least substitutes for, the craving of every man to return to the womb and so acts as a sedative. Are you sure you know why you took up tropical fishkeeping?

A note for those who have been using thermometers for over a year without checking them, especially if they are of the dial or spring-operated type. Are you certain they are in working order? Recently I discovered that my dial thermometer was stuck at 80°F (27°C) and the real temperature of the tank was in the region of 95°F (35°C) and could well have been so for several months! It was a blessing that the tank contained only the ever adaptable blind cave fish, who seemed to suffer no ill-effects!

One of the most effective cures for fin rot is phenoxetol, which has for some time been on the market as a proprietary brand. I was recently in a bit of a quandary about how to cure an axolotl of a severe fungus infection that had even begun to affect the gills. Both my dealer and the text-books were pessimistic, advising no complete treatment apart from surgery. In the absence of anything else I dosed the axolotl with phenoxetol and in a few days it was as miraculously cleared as a goldfish. This is, I think, worth knowing. Fungus infections in amphibians are often far more difficult to eradicate than corresponding diseases in fishes.

Many are the household devices that can be adapted for use in the aquarium. For example, there is nothing more effective than a nylon pan scrubber for removing algae from the aquarium sides. Unlike steel wool, it doesn’t leave dangerous scratches and it doesn’t leave rusty remnants in the tank. However, one word of warning—ensure on purchase that the scrubber doesn’t contain soap or detergent of any kind—it can be fatal! I discovered in a supermarket a few months ago what must be the cheapest ready-made breeding trap on the market. It is a perforated plastic bowl intended I imagine for washing vegetables. However, I found a better use for it. The holes were absolutely ideal for holding back a female puppy and letting the eggs come out whilst the handles neatly reached across the tank. Never have I used a more satisfactory breeding trap.

Any aquarist visiting Pitlochry, Scotland, for his summer holiday has the opportunity of seeing a unique aquarium in which all the fishes are absolutely free. When the Pitlochry dam was built a remarkable fish ladder was constructed to enable the salmon to continue to migrate without impediment, despite the presence of a dam. In the side of one of the upper steps of the ladder a viewing panel has been inserted, through which one can view (in the right season) huge salmon travelling up or down stream. Even out of season there are often smaller fishes—trout or salmon parr—to be seen. Also in the area of the dam are vast salmon hatcheries, regrettably not open to public viewing. If you are planning a visit to Scotland, Pitlochry Dam is thus well worth including in your itinerary.

One of the most annoying characteristics of fish behaviour is their stubborn refusal to behave in the way you want them to at the right time. One can diligently create exactly the right breeding conditions—temperature, pH and special requirements all being taken into consideration, introduce the fish and discover that they absolutely refuse to reproduce. In desperation one returns them, perhaps to a community tank, only to find the next day the gravel littered with eggs and all the fishes eagerly consuming the spawn that would have been adequately protected.

I was infuriated to find Tubifex worms behaving in exactly the same way. Stubbornly they refused to breed under observation. However, I was also feeding them to amphibians in a very wet vivarium in comparatively small quantities. When I came to dismantle the vivarium set-up I noticed for the first time high concentrations of wavy red worms all over the mud and especially behind the stones. The moral seems to be that you want anything to breed, just look the other way. Maybe fishes, and even worms, are embarrassed if you make them reproduce under observation.

Plants for very damp vivariums are always a problem—many just won’t settle down in over-wet conditions. But one that won’t flourish in any other is the sundew. It is to be found in wet and marshy ground—for example in the New Forest, Hampshire, where it feeds on small insects. You may be unlucky, sundews are sometimes awkward and shrivel up and die for no apparent reason, but you can be sure of one thing, it won’t be through too much water, and if you are lucky you will possess an interesting and unusual plant. Incidentally, the insects are only supplementary food and not essential for the well-being of the plant.

THE AQUARIST
Teaching—the Aquatic Way

by B. Whiteside

IN the teaching of science in secondary schools, where the curriculum is not governed by an external syllabus, the scope for making use of aquatic plants and animals as teaching aids is wide. The main reason for having them would be for the teaching of biology, but the school aquarium can also be a means whereby children develop a love for plants and animals as well as developing their sense of aesthetic appreciation. As most aquarists will agree, few aquariums can excel the beauty of a well decorated tropical aquarium with a collection of suitable fishes.

School entrance halls are an excellent place in which to site such an aquarium. Here the display can be appreciated by both staff and pupils, which would not be the case if the tank were set up in one of the laboratories. In this instance the set-up would only be seen by pupils and teachers whose available was such that they had classes in the particular room, as laboratories are placed out of bounds and kept locked unless a science teacher is present. The entrance hall aquarium can be further enhanced by the addition of a variety of pot plants placed beneath or around the tank and the Rural Science teacher in the school will probably be pleased to supply these.

Looking after plants and the aquarium during term time offers no problems as many keen pupils can be found to water plants and to feed fishes and service the tank. During holiday periods the problem is more difficult. Pot plants can be returned to the school greenhouse, which will possibly be looked after by the caretaker or the laboratory technician. These officials may be persuaded to look after school aquariums, too, as holiday periods for them are much less than normal school holidays. Arrangements usually have to be made, during the long summer vacation, for the sending of the school garden and pupils who volunteer for this task could also attend to school aquariums. Motivation for such tasks can be supplied by allowing such pupils to help ripen fruit and vegetables from the garden as a reward for work carried out during holiday periods. Arrangements for attention to school aquariums have to be made between the gardener and curriculum so that pupils can have access to both garden and aquaria.

General Biology

The teaching of biology can be enhanced where a variety of aquatic creatures are kept in the school laboratory. A study of air is one of the basic subjects taken by junior forms and here it is useful to keep some of the common freshwater snails, found in local streams, in small all-glass aquaria. Apple snails, Anodina, Hydra, Euglena, beetles, water bugs and various larvae can be kept for varying periods, and these methods of obtaining oxygen for respiration studied. Frogs can be raised from spawm to adults to show how their metamorphosis and processes of aquatic amphibian. A larger tank could house a number of goldfish but with some of the easier to breed tropical fishes the scope for teaching points is widened.

Tropical fishes can be used as teaching aids for many facets of biology but in the teaching of sexual reproduction they could provide a useful starting point for a series of lessons for older children, where this subject is included in the curriculum.

Although the livebearers are the easiest to breed, it would possibly be better to start with trying to breed some of the simpler egg-layers such as White Cloud Mountain minnows, showing how, in an aquatic habitat, male and female fish do not unite in sexual union. Here fertilisation is external and contact between the two fish is unnecessary. The next stage could be approached by alluding to the frog (Rana temporaria), in which the male clasps the female with his "arms" and, though contact between male and female occurs, fertilisation is still external. Here it must be made clear to the pupils that such external fertilisation is only possible in water and that the developing embryo must be supplied with food—from the yolk cells, just as in the egg of the domestic fowl.

Fishes and Water Plants

Guppies present an obvious choice when studying internal fertilisation. The difference between male and female fish can be studied and note made of the male organ used to introduce sperm into the female vent. Stages in the pregnancy of the female can be studied until she delivers her brood. If, by chance, the pupils are present at the birth of the young, the remainder of the yolk sac can be pointed out. It should be made clear to the children that there is no direct connection between mother and the developing embryos. One can then lead on to aquatic mammals where fertilisation is internal and where the developing young is supplied with food and oxygen via the umbilical cord. Land mammals can then be introduced and the necessity for internal fertilisation emphasised. Rabbits or white mice may also be bred in schools for studying, and reproduction in the human is eventually studied in detail.

Aquatic plants can also be used in various experiments. A common one shows how oxygen is produced and released by a water plant such as Canadian pond weed, in the presence of strong sunlight. This experiment is carried out by inverting a test tube full of water over an inverted filter funnel, below which is placed a quantity of the plant. The whole is placed in a large beaker of water and placed in strong sunlight for a number of days. Before being left the apparatus is made air-free. A quantity of oxygen can usually thus be collected and tested with a glowing wood splinter, which it should relight. For more advanced pupils the phenomenon of cyclosis can be observed if a small portion of a fresh young leaf from the growing tip of Canadian pond weed is mounted, on a slide, in water and viewed under the high power of a good microscope. A very slight warming of the slide may make the process speed up a little. (Cyclosis is the process whereby the streaming protoplasm in the plant's leaf cells causes movement of the chloroplasts—small green plant bodies which assist in photosynthesis.) The chloroplasts can be seen moving along in the plant's tissues.

These are only a few of the benefits of keeping aquria in...
schools. Many more ideas can be and are being used by progressive teachers who find that the little bother entailed in school aquarium keeping is well rewarded. Tropical fishes and plants are the things which are usually in short supply, so that readers with excess of home raised specimens can probably find a welcome outlet in a local school. In such places the absorbing hobby of aquarium keeping is introduced to a large number of children, some of whom will be potential aquarists of the future.

Perhaps aquarists with children of their own might like to use some of these ideas to answer the penetrating questions often asked by children with the enquiring minds of this scientific age. Fishes are certainly a much more useful teaching aid than are the birds or bees!

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OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

I should be grateful for some information about the chocolate gourami.

This rare anabantid is formally known as *Sphaerichthys osphromenoides*. It is native to Sumatra and the Malac Peninsula and attains about 2½ in. in length. It rarely flourishes for long in captivity unless it is placed in soft, peaty water maintained at a temperature of about 78°F (26°C), and is shaded from a too revealing side and or top light by spreading growths of submerged vegetation. It needs small live food and is not suited to community life unless its companions are as inoffensive and as quiet-living as itself. The sexes are not easy to tell apart, except for the more pointed dorsal fin of the male, and the fuller sides of a row-filled female. Very little is known about the fish's breeding procedure. It is said on good authority, however, that the species is a mouth-brooder.

I have been given to understand that young shubunkins can be kept in a tropical tank to act as scavengers. Is this true?

It is true that young shubunkins can be kept in a tropical tank, where they will help to get rid of uneaten fish food and algae. All the same, we do not recommend them. For one thing, they require considerably more oxygen to stay alive than the average warm-water species. For another thing, they soon outgrow their container.

Please give me the names of a few large, attractively marked and easily cared for tropicals suited to living together in a well-planted d fête. by 12in. or 1in. tank.

Pearl gouramis, rosy barbs, clown barbs, Australian rainbow fish, giant danio, keyhole ciclids and silver sharks.

I have been told that crumbs of hard-boiled yolk of egg make a valuable food for tropicals. Do you agree?

For some newly hatched fry the answer is yes; but for grown fish the answer is no; for crumbs of hard-boiled egg droppings into the aquarium, the swallowing of an eye into countless miniscule particles which are ignored by the occupants of the tank and only lead to clouding and sometimes pollution of the water.

A friend asserts that labyrinth fish can be drowned. Is this a fact?

The answer is yes. If a labyrinth fish is prevented from taking in fresh air death by drowning will soon result.

What is your opinion are the best algae-eaters to introduce into an aquarium?

*Gyrinocheilus aymonieri*, the so-called Siamese sucker fish, comes first to mind. This peaceful and highly interesting species seems to do little else but hunt around for algae. Next, we would recommend *Plecostomus (Hypostomus) plecostomus*, a large-growing catfish from Brazil.

Please outline the general requirements and maximum size of *Thoron jacetus*.

This essentially marine species needs salty, well-aerated water and a spacious aquarium. It will accept almost any kind of food and flourishes best at a temperature in the middle seventies (°F). In its smaller sizes it is reasonably well-behaved, but as it matures it becomes a spiteful bully. In the wild it attains a length of 12in. but few specimens reach this size when kept in captivity.

I recently saw some handsomely coloured fish called *Clarias lacustris* in a dealer's shop. I should very much like to know if they are rare and worth keeping as aquarium species, and whether or not it is easy to keep in good health in a community aquarium.

This 5in. African characin is found in the wild from Sierra Leone to the Congo. It is not ideally suited to the average community tank because it is rather shy and is apt to be browbeaten by boisterous companions. Further, it needs plenty of swimming space in clear, peaty water and a diet consisting in the main of insects and their larvae.

Every time I switch off the artificial aeration, the six tiger barbs in my community tank rise towards the surface and stay in a group as though they are too scared to move away for fear of losing oxygen. Their companions—livebearers and small tetras—carry on as usual. What is the reason for the barbs' strange behaviour?

That tiger barbs are always among the first fishes to suffer from the effects of overcrowding or a diminution in the oxygen content of the water is well known to experienced aquarists. All the same, it is a habit of these fish to take up a slightly head-down position near the surface, and stay put, as it were, for brief or protracted periods. We can only
COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

During my visits to the British Aquarists' Festival, I have been struck by the attractive appearances of the rocks in some of the best-furnished tanks. Could you tell me the name of this particular rock and where it can be obtained?

The rock was probably Westmorland rock, well weathered. This makes a fine setting in a furnished tank and can be used as a moss bed. On the other hand, the rock may have been from some special rarer kind. Some exhibitors are very secretive about the source of their rockwork. I have met aquarists who guard the secret source of rocks and bottom compost with their lives and know who creep out at night to certain rivers to collect their gravel etc., unobserved!

I had decided to refresh my tank in the manner described in The Aquarist, October, 1966, using a thin layer of cement to cover glass and coal to build up the strata. Having let the mixture set for 3-4 days I found the cement had not taken to the glass. What can I do to make any suggestion?

If you had used Prompt cement you would have found that it would have stuck to the glass better than the kind you named. This cement sets rock hard in a matter of half an hour, and will even do so under water. I have found it ideal for all underwater jobs.

I have bought four coldwater dogfish (Umbra kromeri), but have not been able to find anything at all about them in any books. I would be grateful for information about these fish: temperature, feeding, breeding, sexing, natural location and whether they can be kept in an outdoor pond all the year round.

The fish in question is a native of Hungary and lower Austria, and grows to about 3½ inches in length. A rather similar fish is found in North America, where it is known as the mud minnow (Umbra pylgmaea). These fish can stand the ordinary winter temperatures out of doors in this country. They prefer live foods but can be trained to take dried foods as well. They are difficult to sex, as are most of the egg-laying fishes. When the female is full of eggs her body is fatter than that of the male. When viewed from above this difference usually shows up quite plainly unless the examination takes place soon after a spawning. They require a large tank for spawning, filled with water plants and algae (the filamentous type is preferred). When about to spawn they make a kind of cave in dense vegetation and then this is closed and guarded by the male. These fish are able to take in air from the atmosphere and so make constant dashes to the surface. They spend a lot of time at the bottom of the tank. Some years ago when judging at Hendon show I was surprised to find a mud minnow (Umbra pylgmaea) in a coldwater class. It had been caught in an outdoor natural pond and had no doubt been released there at some time. It has added to the popular notions of waving about the dorsal fin like many tropicals, a running wave going from front to back.

Please let me know if part of an article on plants in a book called The Aquarist's Encyclopedia is correct. It says that water plants give off oxygen during the dark hours and so aerate the water. Some members of our Society consider that the opposite is the case. Will you comment please?

The statement is incorrect and may be a printing error. Water plants give off oxygen under good light conditions and absorb carbon dioxide. At night or during darkness the process is reversed. On dull days it is a good plan to give extra artificial light to tanks so that the plants can assist in the aeration of the water.

When should goldfish in an outdoor pond have their first after-winter feed?

Once the water warms up a little the fish will become more active. It is then that feeding can be commenced. It is advisable to give small or broken earthworms for a few first feeds and do not feed every day. Be guided by the weather and activity of the fish. When the water is very cold the fish are sluggish and do not require much food. It also takes them much longer to digest what food they do eat when the water is cold.

When I constructed my garden pond I made the mistake of siting it at the lowest part of the garden. Now when there is heavy rain the surplus water runs into the pond and soils the water there. How can I overcome this trouble?

As you have found out, it is undesirable to site a pond too low in the garden as it makes it so difficult to empty if required. You will have to construct a small wall around your pond so that the water draining from higher ground is prevented from getting into it. Perhaps a rockery can be incorporated with the scheme so that the addition is partially hidden.

March, 1965
I have had trouble with fin rot on my goldfish, kept in a tank 15in. by 10in. I think I have cured that trouble but the fish is developing black marks on the body and head. I have a filter unit and the water temperature is 70°F (21°C). Why is the black forming?

The black is usually a sign that there has been some damage to that part and this is where new growth has been made. The new growth is often black at first but is likely to change back to the red after a time. There is nothing you can do about it but have patience and all should be well. Why do you keep the tank at 70°F for goldfish? These fish are quite hardy; my own fantails have been under several inches of ice and then snow for a fortnight and they are all right. Goldfish do not need a high temperature during the winter months.

I have a sunken concrete tank in each of my two greenhouses, each tank having an area of 80 square feet. One house is at 50°F and the other at 60°F. They are fed by rain water from a fished roof. The water entering the tank is not contaminated by the manure. The temperature of the water in the tank is 50°F when the rain is falling and 60°F when the sun is shining. I would like to know if I could keep fish in the tanks other than goldfish?

The tanks would be ideal for breeding fancy goldfish, the warmer house being used for actual breeding and the other one for rearing. You could breed any of the fancy goldfish such as fantails, veiltails, orandas, moors or shubunkins. Golden orfe and sunfish could also be kept. I do not like the idea of rainwater from the fished roof. This may bring in many impurities. It would be better to divert this water for a time so that the roof is well washed before rainwater is allowed to run into your tanks.

I have a moor which has developed a bad spot just behind the gill. A couple of scales seem to stick out with a film of blood surrounding them. It is difficult to see these pests on a fish as they are transparent. They can cause quite an angry wound if not removed. They can be picked off with tweezers or if the fish is laid in a solution of a quarter teaspoonful of Dettol to a gallon of water the whole will leave the fish. A further treatment after a week is advisable.

I have a 5-year-old nymph goldfish which has been in perfect condition and spawned for the first time last summer. Now it is at 50°F and the other at 60°F. I would like to know if I could keep fish in the tanks other than goldfish?

The description you give indicates that the fish has been attacked by a fish louse (Argulus). These parasites suck the juices from a fish and attach themselves by means of suckers. It is difficult to see these pests on a fish as they are transparent. They can cause quite an angry wound if not removed. They can be picked off with tweezers or if the fish is laid in a solution of a quarter teaspoonful of Dettol to a gallon of water the whole will leave the fish. A further treatment after a week is advisable.

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These fish with a short deep body are often prone to swim bladder trouble once the cold weather sets in. The fish can be cured of the fin trouble by increasing the fish in a salt bath for several days. Place the fish in a gallon of water and add a heaped tablespoonful of salt. Do not stir but just allow it to dissolve steadily. Do not feed the fish whilst under treatment. After 4 or 5 days the fish should be cured. Then add fresh water so that the strength of the solution is gradually restored to almost normal.

Just recently I have been given three golden orfe, which I had never heard of before. I have read many books but cannot find any information on them. Can you give me some information about them, such as diet, temperature etc.?

Golden orfe are a fish which prefer very clear water and like it fairly cool. They are essentially a river fish. They are very active and soon grow to a length of upwards of 18 inches. They are not particular as to food but prefer live food. Garden worms and the usual live foods will be accepted gratefully by them. In Goldwater Fishkeeping (Jan 4d post free from The Aquarist) you will find information on keeping these fine fish.

I am thinking of buying a greenhouse to house my fancy goldfish. It is made of siliconised cedar wood and I am wondering if the condensation from this will harm the fish if it drips into the water.

I do not think that there will be any trouble from drip. The water should run off without taking anything harmful into the tanks. You will have to provide either blinds or shading on the glass for the summer as a greenhouse will soon become much too hot for fancy goldfish. A proper fish house is much better as this will not have so much glass and an advantage both in summer and winter.

I have taken over a house with a garden pond about 55-60 square yards in area. There is a general type of arrangement up as the pond is not under if I can point it over with anything to stop this loss of water. I think that the concrete is porous; there do not appear to be any cracks.

You should re-line the pond with a mixture of one part of fine sharp sand and a half part of coal. This mixture will stick adhering to the pond and also be waterproof itself. It would not be an easy task to dry a pond the size of yours, especially at this time of the year.

I would like to know if it is advisable to feed goldfish on ants' eggs bought from a shop?

These are not ants' eggs but the dried pupae of ants. As such they are not of much value as fish food, though they can be used if freshly obtained from a garden ant nest. There are far better foods for fishes advertised in The Aquarist each month.

I am building a garden pond in which I wish to keep small trout, besides other fish. I believe this is quite easy provided that the water is kept clean and either moving or aerated. Can you please advise on the best methods?

You can keep small trout in a garden pond but as they grow you may find that they attack any other small fishes there. Trout are not averse to eating any other fish small enough to get in their mouths. It is essential to have good oxygenated water for trout as their preferences are for clear fast-running rivers. A good type of fish pond to construct is a well raised rockery beside the pond and then a series of small ponds and channels to lead into the pond. An electric pump can be installed to raise the water from the pond and it can then flow back along the channel and over small waterfalls. During this time the water will be well oxygenated and so ensure that the trout should not lack this important gas. One point to watch is that stale food must not be left in the water. Even with the waterfall working poisonous water cannot be turned into fresh. Alternatively a fountain can be fitted to be worked by an electric pump. Several small pumps are on the market and regularly advertised by dealers in The Aquarist.

I am interested in becoming a show judge for tropical and coldwater fishes. How can I set about this?

To become an authorised judge under the Federation of British Aquatic Societies you must apply to the secretary (K. J. A. Pye, 33, Stede’s Road, London, N.W.3). Prospective judges are usually chosen from aquarists who have gained considerable experience both at keeping and breeding various fishes and also those who have been successful exhibitors for a few years. Such aquarists are usually recommended by their club. At infrequent intervals classes are held by the Federation for candidates and then if satisfactory they are first classed as "B" judges, when they can judge club shows, and later when they have gained experience by perhaps accompanying an "A" judge they are up-graded.

The Aquarist
The Blind Cave Fish

Notwithstanding the deprivation of its sight by untold centuries of life underground, the blind cave fish (Astyanax mexicanus), a characin from the Lina Potosí, Mexico, never bumps into rockwork or the sides of its aquarium, becomes entangled in the plants, or head-on collisions with other fishes sharing its tank, fails to find its food. That it avoids doing these things is due, without a doubt, to its heightened senses of location and vibration. Indeed, it can snap up worms wriggling in the water as quickly, if not more quickly, than normal-sighted fishes. Obviously, its sense of smell must be very acute; for it can find pieces of meat or dried food lying on the bottom in the most minimal no time. Clearly, then, there is no need to emphasise the fact that A. jordani makes a most praise-worthy scavenger.

In general appearance it is flesh coloured overlaid with a grey sheen. The fins are faintly or pronouncedly tinged with pink. The places where the eyes were in the long ago (the species is said to be derived from Astyanax gossei mexicanus), specimens of which must have become severed where no light penetrated by a landslide or tremors) are rudimentary sockets partially or completely grown over. It is peaceful by nature and attains about 3 inches in length.

The AQUARIST Crossword

Compiled by L. Bradley

CLUES ACROSS

1. Firemouth (16, 5).
9. Do husband (Amph.) (7).
10. Light of the aquarium (7).
11. Fall in drops (4).
12. I divide perfectly (5).
13. Irritation caused by overfeeding fish (6).
17. A stoppage of trade by authority (7).
18. Rises to make up tables (7).
19. Fish of green Robbie (7).
23. Impertiency (4).
25. Turkish council of state (5).
26. Air — used for aeration (4).
28. Obscure (3).
30. Common English bass (3, 4).

CLUES DOWN

1. Scavenger whose name means bronze and helmeted (9, 6).
2. Coo to a North European sea fish for reducing the temperature (7).
3. — head, member of the goldfish family (4).
4. Mast rod (Amph.) (7).
5. Communication sent by Meg about rough seas (7).
7. Behold this person to finish the winner (7).
8. Contributors to The Aquarist? (15).
14. In the aquarium copper in an example of this kind of substance (5).
15. Chief of fallen angels (9).
19. Iridescent anabantid (7).
20. One of nine pairs (7).
22. See 19 down.
27. Caudal fin (4).

Solution on page 225
Monthly reports from Secretaries of aquarists’ societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

THE chairman of Brighton and Southern A.S., Mr. B. Shotton, reported a very successful year with average attendances, for the first time since 1964, of 26 per cent of members. The show held its first open show and 177 entries were received. Apart from the normal attractions in the evening, the entries went off without a hitch.

The Club was very proud to announce that it had gained an honorary presidency in Miss Doris Bryon. Her husband is a very keen breeder of fishes. It was also announced that the open show for 1965 will be held on Saturday, 12th June, details of which will be forwarded to all secretaries shortly.

The following committee was elected for 1964: Hon. chairman, Mr. J. Coleman; sec. secretary, Mr. R. J. Pelham; treasurer, Miss Pam Carr; show secretary, Mr. R. Howells; also P.R.A. delegate; and in addition Mr. P. Parry, Mr. B. Shotton, and Mr. N. Peters. Mr. R. G. O. L. Liss presented the club trophies to the following members: Mr. R. N. Nicholls, Dr. R. W. Stone, Miss Nicholls, Mr. D. F. Robinson, Mr. A. K. Robinson, Mr. D. N. Simmons, Mr. G. B. Thomas, Mr. R. Howells, Mr. G. G. Thomson, Mr. R. Nicholls, and Mr. N. C. Young. Mr. J. F. Hall presented the new Morris Trophy to Miss Pam Carr. Norcav's Cup, Mr. D. R. Topp, Nicholls Cup for Best Fish of the Year, Mr. J. Coleman, David Harris Cup for Best Guppy, Miss Pam Carr: Furnished Aquarium Class A, Miss Pam Carr: Furnished Aquarium Class B, Miss Pam Carr.

For details of the Club’s activities please write to the hon. secretary, J. A. Pelham, 79, Vaux Road, Portland, Sussex.

THE Dewsbury and District A.S. open table show will be held on 9th May at the Social Centre for Disabled, Daisy Hill, Dewsbury, Yorks. Schedules are available from: Mr. J. Thompson, 53, Sunnybank Road, Mirfield, Yorkshire.

The activities of the Freeland A.S. over the past year have included a lecture on furnishing fishes, two lectures from aquarists outside the Club. An interesting feature of the Club is the recently formed and furnished tank competition at present being judged, a great many entries being received.

ON Monday the 19th of February, the New Forest A.S. was formed by the amalgamation of the Allomans Association and the Lyndhurst Gardeners Club. At the Baptist Church Hall, Lyndhurst, with a talk illustrated by coloured slides on “Water-Lilies,” given by Mr. N. H. Bennett.

AT the Thurrock Aquarist Club meetings for February the chairman, Mr. R. Nicholls, gave two interesting talks, one on the setting up of a tank to achieve the perfect balanced aquaria and the other on the anatomy of livebearers. Of the 100 members present 70 entered livebearers, a table show took place for first and second places and the results were as follows: 1st, Mr. E. Nicholls (selfless); 2nd, Mr. D. Harris (Dartisor tied sword); the class had 13 entries. The Club meets on alternate Monday evenings at 8 p.m. at Gypsy Lane Hall, Grays.

New members are always welcomed and they should contact the chairman, Mr. R. Nicholls, 37, Arthur Street, Grays, Essex.

NEW officers of the Postpony and District Aquarist and Pondkeepers Society are as follows: Mr. J. Stappers, chairman; Mr. R. Smith, treasurer; and Mr. H. R. Clarke, secretary. Flynn’s Bungalow, Gurnell Road, Postpony, Mon.

AT the annual general meeting of the Harwich and District A.S., the secretary was happy to report the Club growing steadily stronger in membership. The chairman thanked Mr. Margrove for his great efforts as founder/treasurer/secretary ever since the Club was formed... Mr. Margrove has given up his post owing to his forthcoming marriage. Mr. Went, the treasurer, reported the Club to be in a very sound financial position. The officers elected for the coming year were: Chairman, Mr. T. Newcombe; vice-chairman, Mr. R. Stilling; treasurer, Mr. P. Went; librarian, Mr. A. Maddox; secretary, Mr. J. Farthing, 12A, Hamilton Street, Parkstone, Essex. New members will be very welcome. Meetings are held at the Vacumatic Sports Club on the first Sunday of each month.

RECENTLY the Blackpool and Fylde A.S. held their annual general meeting and the members elected the following club officers: President, Mr. C. Coles; vice-president, Mr. C. J. Finch; secretary, Mr. G. N. Hardy; and M. J. Elmore; chairman, Mr. W. K. Pearson; vice-chairman, Mr. M. G. Howard; treasurer, Mr. G. Howard; accountant, Mr. R. Goodwin; Equipment officer, Mr. T. Bowler; equipment officer, Mr. J. T. Brown; publicity officer, Mrs. M. J. Finch; equipment officer, Mr. G. N. Hardy. Members elected to the executive committee were Messrs. C. C. C. Ford, R. A. Liddle, R. Simmons, J. Smith, Jaifer, and F. Willson.

AT the recent meeting of the Kingston and District A.S., the following officers were elected for 1965: Chairman, Mr. D. W. Ellis; secretary, Mr. C. Coles; treasurer, Mr. C. J. Finch; equipment officer, Mr. G. N. Hardy; and M. J. Elmore; chairman, Mr. W. K. Pearson; vice-chairman, Mr. M. G. Howard; accountant, Mr. R. Goodwin; Equipment officer, Mr. T. Bowler; equipment officer, Mr. J. T. Brown; publicity officer, Mrs. M. J. Finch; equipment officer, Mr. G. N. Hardy.

NEWS from the Ilford and District Aquarist and Pondkeepers Society’s annualプリントと議論の結果として、過去の年のための入場料が設定されました。2月の会議で、Societyのスポンサーautoformの紹介と経済的アピールのスケジュールが公表され、次年度の限度を設定するためにのためのこれらの活動を入場料を実施しました。1965年の2月に新しい議会席はRidgway Primary School、毎月、初回および二回目の火曜日の毎月。

The Raglan A.S. third open show will be held at the Railway Institute, Siddals Hall, Derby, on Wednesday, 26th March. The first prize is £10. Further information and entry forms can be obtained from Mr. A. Wilder. Show Secretary, 18, Finchley Avenue, Derby.

G. Howard, 56, Stanford Avenue, Blackpool, Telephone no. 4276. The officers elected at the annual general meeting of the Harwich A.S., for 1965, are: Chairman, Mr. J. Soames; vice-chairman, Mr. R. Harlow; secretary, Mr. R. E. Harvey; treasurer, Mrs. V. Davenett; show secretary, Mr. R. C. Oslo; auditor, Mr. J. Hill; equipment officer, Mr. J. Morris; Mr. A. Cox; Mr. E. Spence; Master R. Martin and Master J. Martin.

The Society meets on the first and third Wednesday of each month at the dressing Saloon, Bush Fair, Hatfield, Essex. NEW members and visitors are always welcome and the society would also welcome correspondence from societies abroad. The Secretary’s new address is 28 Long House, Bush Fair, Hatfield and the show secretary’s address is 143 Shorebridge, Hatfield.

OVER 50 members and friends attended the annual dinner and dance of the East London Aquarist and Pondkeepers Association and had a most enjoyable evening. The guests of honour were Mr. R. Taylor, who is a founder member, his wife, and Mr. and Mrs. S. Wade. Following the election of officers there was a discussion on the proposed show for 1965, and the date of the show was fixed for the first Saturday in October. The show will be held once again in September. The Society’s new address is 44 St. Erkenwald Road, Barking, Essex. The club meets on the first and third Wednesday of each month at the Royal Road School (near level crossing), Barking at 9 a.m. The second annual dinner and entertainment is 4 St. Erkenwald Road, Barking, Essex.

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THE AQUARIST
MEMBERS of the Lowestoft Aquarium Society enjoyed a talk by Mr. D. Humphrey who is the head fish-keeper at Maritime, Lowestoft, Mr. Humphrey spoke about the different types of fish and their breeding habits, and paid particular attention to a few of the odd phenomena such as the Jordanella fluviatilis. He then explained to members the difficulties of keeping fish and animals in public plans and pointed out to them the importance of keeping a number of snapping elephant.

At the second annual general meeting, the results of the two competitions were announced and new officers elected. The winner of the home aquarium competition was Mr. D. C. Baker, second, Mr. R. Holmes, and third, Mr. D. C. Taylor. The winner of the best all-around competition was Mr. J. Mills, second, Mr. D. Taylor, and third, Mr. D. C. Taylor. The new officers were elected as follows: President, Mr. D. C. Baker; chairman, Mr. J. Mills; secretary, Mr. D. Taylor; treasurer, Mr. D. C. Taylor.
The society meets on the second Sunday in every month at 3 p.m. and a special meeting is held on the fourth Wednesday in the month at 7.30 p.m. There will also be an open meeting on Sunday, 9th January, when three winners of the two competitions will be announced.

The Raislott Section of the Fancy Guppy Association held its annual general meeting recently, when the following officers were elected for 1965: Chairman, Mr. T. H. Taylor; vice-chairman, Mr. F. Stone; secretary, Mr. T. G. Goodall; treasurer, Mr. J. Mills; and representative, Mr. E. Riley. The committee members are: Mr. D. Taylor, Mrs. S. Taylor, Mr. E. Riley, and Mr. J. Mills.

The East End and District A.S., Chairman, Mr. Moore, at the annual general meeting, expressed his appreciation to all members who had helped in any way to promote the club's activities, especially the open show that was staged earlier in the year. This had proved an unqualified success and he looked forward to even more ambitious activities in the coming year.

The secretary drew attention to the continuing increase in membership which was very gratifying and indicated the interest that was being shown in the hobby. Show secretary, Mr. Baker, outlined the arrangements for the show to be held at the East End Aquarium on 19th June. Preparation for the show was in full swing and an estimate of 1,000 exhibited aquaria, forty coldwater and thirty heated tanks, were provided for the entries. Mr. Baker thanked all members who had volunteered to lend a hand and that the enthusiastic response bode well for the success of the show.

Plaques were awarded to the following members: Breeders (employers), Mr. Moore; breeders (livebearers), Mr. Baker; breeders (oxygenators), Mr. Baker. Show secretary, Mr. Peters; show secretary, Mr. Palmer; and show secretary, Mr. Cooper. Committee members: Mr. Smith, Mrs. Smith, Mrs. Moore.

The club meets on alternate Wednesdays at The Quay Rooms, High Street, Lowestoft, starting at 7.30 p.m.

Mr. Mears, A.S.A., annual general meeting was held recently and Mr. Mears, chairman, stated that the society was in a sound financial position. Mr. Mears, secretary, gave a report on the activities of the society during the year. He thanked all members for the enthusiasm shown and looked forward to the good work through the coming year.

The following new committee were then elected: Chairman, Mr. F. Mullal; vice-chairman, Mr. R. W. Smith; secretary, Mr. R. Moore; treasurer, Mr. R. W. Smith; editor, Mr. E. T. Collins. The date of the open show was announced as 6th May.

The latest leading places in the competitions of the Norwich A.S. are as follows: Scott Cup, 1st, 2nd, 3rd, and 4th; Sir Charles, 1st, 2nd, and 3rd; Mrs. Phipps, 1st, 2nd, and 3rd; and Mr. W. Smith, 1st, 2nd, and 3rd. The society meets on alternate Wednesdays at the Quay Rooms, High Street, Lowestoft, starting at 7.30 p.m.

The Annual General Meeting of the Aquarium Society of America was held at the Atlantic Hotel, Atlantic Avenue, Lowestoft, on 5th August, 1965. The following officers were elected for 1965: Chairman, Mr. D. Maleon; secretary, Mr. W. E. Reevi; treasurer, Mr. D. K. Wilters; assistant secretary, Mr. E. Nolde; and assistant treasurer, Mr. R. Gillett. The society meets on the second Wednesday in every month at the Atlantic Hotel, Atlantic Avenue, 7.30 p.m. All aquarists welcome.

The Witham and District A.S. annual general meeting was held recently and the following were elected for 1965: Chairman, Mr. D. Maleon; secretary, Mr. W. E. Reevi; treasurer, Mr. D. K. Wilters; assistant secretary, Mr. E. Nolde; and assistant treasurer, Mr. R. Gillett. The society meets on the second Wednesday in every month at the Atlantic Hotel, Atlantic Avenue, 7.30 p.m. All aquarists welcome.

At the annual general meeting of the Hull Aquarium Society, the following officers were elected: President, Mr. D. Robinson; vice-president, Mr. E. Chamberlain; chairman, Mr. W. Reevi; vice-chairman, Mr. W. Hall; secretary, Mr. W. Williams; 8th Woldsgate Road, Anlaby Road, Hull, E. Yorks; treasurer, Mr. A. W. Overby; show secretary, Mrs. J. Robinson.

The Newcastle upon Tyne and Livebearer Society annual general meeting was held at the Quay Rooms, Newcastle upon Tyne, on 30th April, 1965. The following officers were elected: Chairman, Mr. J. Swanepoel; vice-chairman, Mr. R. Skewers; hon. secretary, Mr. V. J. Weat; treasurer, Mr. A. Davidson; show secretary, Mrs. J. Lench. Meetings are held at the Toll Bar Inn on the first Friday in every month, and table shows will be held at each meeting.

New members are cordially invited to attend and further details are obtainable from Mr. J. Swanepoel, 32 Wainwright Road, Sunderland.

The society met at the Spa Hotel, Bridlington, on 2nd June, 1965, by thanksing the hospitality of the Spa Hotel, for all the work he has done for the club.

Towards the end of January the members of the Wakefield and District A.S. visited the trout hatchery at Pickering and on the return journey called at the Flamingo Park Zoo, which is very accessible, to see the zoo, which is very accessible, to see the different types of animals that are kept there. The exhibition was held on 28th June, 1965.

The annual general meeting of the Wakefield and District A.S. was held at the Spa Hotel, Bridlington, on 2nd June, 1965, with a special meeting held on the fourth Tuesday in the month, and the meetings are to be held at the Midland Hotel, Wakefield, where any new members will be warmly welcomed. Any information can be obtained from the secretary, Mr. J. Swanepoel. The annual general meeting will be held at the Midland Hotel, Wakefield, on 2nd June, 1965.

The Exmouth and District A.S., Chairman, Mr. Moore, at the annual general meeting, expressed his appreciation to all members who had helped in any way to promote the club's activities, especially the open show that was staged earlier in the year. This had proved an unqualified success and he looked forward to even more ambitious activities in the coming year.

The secretary drew attention to the continuing increase in membership which was very gratifying and indicated the interest that was being shown in the hobby. Show secretary, Mr. Baker, outlined the arrangements for the show to be held at the Exmouth Aquarium on 18th June. Preparation for the show was in full swing and an estimate of 1,000 exhibited aquaria, forty coldwater and thirty heated tanks, were provided for the entries. Mr. Baker thanked all members who had volunteered to lend a hand and that the enthusiastic response bode well for the success of the show.

Plaques were awarded to the following members: Breeders (employers), Mr. Moore; breeders (livebearers), Mr. Baker; breeders (oxygenators), Mr. Baker. Show secretary, Mr. Peters; show secretary, Mr. Palmer; and show secretary, Mr. Cooper. Committee members: Mr. Smith, Mrs. Smith, Mrs. Moore.

The club meets on alternate Wednesdays at The Quay Rooms, High Street, Lowestoft, starting at 7.30 p.m.

Crossword Solution

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C I C H L A S O M A M E E K I
O I I I I E I V C
R H O D O R A S U N F I S H
Y L I N E R S S K C T I
D R I P S I G E A L T I C H
R A G W O R M E M B A R C O
A X L L
S T O R I E S T R I G G E R
A P C K R S O L A A
E L A N D I V A N P U M P
N L B B T N E R R H
E V I D E N T S E A D A C H E
U N A L L O I M E R
S P E C K L E D M O L L I S

March, 1965
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(On main A.1 road) Darlington
Telephone: Darlington 5991
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Powell, M. C.
The Honey Pot,
Claypath, Durham City
Telephone: Durham 2108
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Skilton, C. J., Aquarist
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